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MAN:

AN INTRODUCTION TO ANTHROPOLOGY.

BY

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PREFACE.

THE first edition of this book, published in 1900, has been out of print for some time. In this edition the same general plan has been followed; and, while there have been but few changes made, there are a number of additions. A new chapter has been added on "The Development of Culture" in which some of the views presented, I think, can not be found elsewhere.

There are many excellent works written on zoology, treating of the various phases of animal life, some of them ending with, and others including, man; but, beyond mentioning the different races of mankind, the majority of them have very little to say relative to the human species; and, on the other hand, the many different books, so far as I know, written in the English language, treating of mankind, start out with the consideration of man as man, and make little or no reference to the zoological aspect of the subject, *i. e.*, the zoology of man. There seems to be a break in our literature on this

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subject in these two departments of knowledge, which in this work I have attempted to an extent to fill, although, I fully recognize, in a very brief and necessarily superficial manner in a volume of this size.

The importance of classification is recognized by all students of science, although unfortunately there is much difference of opinion relative to what characters should constitute the criteria for classification. The zoological arrangement of the sub-kingdoms in this book is that adopted by Prof. Alexander Macalister, of the University of Dublin; while in the arrangement of the orders of the mammalia the method of the late Prof. H. Alleyne Nicholson, of the University of Toronto, with slight modification, has been followed.

Anthropology seems to be, unfortunately, one of those subjects about which the vast majority of persons know very little. This is exceedingly unfortunate, and, owing to the fact that it has for its consideration our own kind, should not be so. Many individuals would be ashamed to acknowledge they were not acquainted with the date of some particular war or event in recent history, but would acknowledge without a blush, they had never heard of their probable ancestral types, as represented by the Neanderthal skull and the man and woman of

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Spy. Therefore, until anthropological knowledge is more general than at present, too much cannot be written on the subject, so long as truth and accuracy are maintained.

In a volume of this character, treating of such a broad field of knowledge as that of general anthropology, it is not possible for any one writer, no matter how intimate he may be with the subject involved, to assume absolute responsibility for all statements made; and, therefore, the many references to the names and investigations of other workers in the same domain are not only advisable but, to an extent, necessary, as they furnish the reader with the names of those authors whose writings may almost be considered to have created the science of anthropology, and to which attention should be given.

The endeavor has been made to start at the beginning of the long chain of evolutionary development in the life-history of the earth, and, by gradual stages of differentiation, reach man, and finally give some consideration to the different races of man.

The classification of mankind herein adopted is the old one based upon color, which, owing to its general acceptance, its ease of comprehension, and the uniformity of the geographical relation of the

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races, is the most suitable in a work of this character. It will be noted that, apparently, the rule of from the lower to the higher has been departed from in the instance of the Red race in placing it between the Yellow and White races. The reason for doing this is that the affinity between the Yellow and Red races seems to be so close that we must consider the latter race to be dependent upon the former for its origin, and hence this arrangement. It might possibly have been well to have considered them as constituting a single race.

In the sub-title of this work the word Anthropology is used in its most comprehensive and broadest sense, although much herein included belongs to that special field of anthropology termed Ethnology, which has for its consideration the relations of the different varieties of mankind to each other (Latham, Keane). The science of Ethnography, which is descriptive of individuals irrespective of their relationship to other peoples, is also necessarily touched upon. These terms are here mentioned for the reason that confusion continually occurs owing to the incorrect usage of them.

Many authorities have been consulted in the preparation of this work; but especial obligation should be acknowledged to the *Ethnology* by Prof. A. H. Keane, *The Earth and Its Inhabitants* by Elisée

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Reclus, *The Races of Man* by Oscar Peschel, and many of the writings of the late Dr. Daniel G. Brinton. Acknowledgment should also be made to Prof. William Z. Ripley, of Columbia University, for certain suggestions of value which he very kindly made.

W. E. ROTZELL.

NARBERTH, PA., *December 21st, 1904.*

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CONTENTS.

PAGE

CHAPTER I.

THE EARTH'S LIFE-HISTORY AND THE POSITION OF MAN.

Matter and force. Inorganic and organic matter. Protoplasm. The Cell. Vegetable and animal forms. Classification. The sub-kingdoms of the animal kingdom. Characteristics of the vertebrata. Characteristics of the mammalia. The order of the primates. The family Hominidæ. The genus homo and the species sapiens. Anthropology. Special creation. Evolution. The nebular hypothesis. The modification of the earth and the geological stratifications. The age of the earth. The place and time of the origin of man. "Lemuria." Archæological finds bearing on the antiquity of man, from the valley of the Somme, the cave of Aurignac, and the Kitchenmiddens. Tertiary man. The Neanderthal skull. The man and woman of Spy. The Naulette jaw. The Pithecanthropus erectus. Living man. The skull. The face. The orbital index. The facial angle. The maxillary angle. The teeth. The pelvis. The limbs. The hair. The color of the skin. The living races of man 13–66

CHAPTER II.

THE BLACK (AFRICAN) RACE.

The characteristics of the race. Color of the skin. The hair. The skull. The jaws. The cheek bones. The nasal index. Stature. The branches of the race. The Negrillos. The Pigmies, their distribution and characteristics. The Akkas, the Wochua, the Andamanese, and the Batwa. The Hottentots, their distribution and characteristics. The Bushmen, their distribution and characteristics. The True Negroes. The Soudanese and their

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PAGE

distribution. The Wolofs, the Serers, the Baniuns, the Mandingoes, and others. The Bantuas, their characteristics and distribution. The Zulus and the Kaffirs. The ability of the Negro. Slavery. Status of the race in America 67–84

CHAPTER III.

THE YELLOW (ASIAN) RACE.

The physical characteristics of the race. The original home of the race and its distribution. The Sinitic and Sibiric branches. The Chinese, their culture, their language and their religion. The Thibetans. The Indo-Chinese or the Thibeto-Indo-Chinese. The Tunguses. The Kalmucks. The Tartars. The Turks. The Finns. The Lapps, or Laplanders. The Chukchis. The Namollos. The Kamschatkans. The Giliaks. The Aleutians. The Ainos. The Japanese, their physical characteristics, their origin and their culture. 85–102

CHAPTER IV.

THE RED (AMERICAN) RACE.

The characteristics and origin of the race. The Glacial Period in America and its bearing on the antiquity of man. The physical uniformity of the American Indians, their mental endowments, their culture and their languages. The Eskimos. The Algonkins. The Crees. The Chipeways. The Blackfeet. The Lenapes. The Iroquois. The Cayugas, the Senegas, the Onondagons, the Oneidas and the Mohawks. The Dakotas or Sioux. The Muskhogeans, the Choctaws, the Creeks and the Seminoles. The Caddoes. The Pawnees. The Yumas. The Pueblos. The "Mound Builders." The Sonora. The Nahuas or Aztecs and their civilization. The Toltecs. The Otomis. The Totonacos. The Zapotecs. The Mixtecks. The Mayas and their civilization. The Caribs. The Arawaks. The Tulpis, the Gês, the Crans, the Botocudos, the Coroados, the Puris and the Malalis. The Qquichuas or Incas. The Patagonians. The Fuegians 103–127

Digitized by Google

PAGE

CHAPTER V.

THE WHITE (EUROPEAN) RACE.

The physical characteristics of the races. The race in the region of the Mediterranean Sea. The South Mediterranean branch. The Hamites. The Berbers. The Libyans. The Moors. The Numidians. The Guanches. The Rifians. The Egyptians and their culture. The East Africans. The Bedjas. The Daakals, or Afars. The Gallas. The Somalis. The Massi. The Semites. The Arabs. The Abyssinians. The Armenians. The Syrians. The Assyrians. The Babylonians. The Jews. The North Mediterranean branch. The Basques. The Aryans and their origin. The Umbrians. The Samnites. The Latins, or Romans. The Celts. The Highland Scotch. The Irish. The Manx. The Welsh. The Teutons. The Goths. The Vandals. The Angles and Saxons. The Danes. The Norsemen. The Franks. The Lombards. The Swedes. The Norwegians. The Icelanders. The Germans. The Slavs. The Huns. The Russians. The Ruthenians. The Poles. The Czechs. The Bulgarians. The Wends, or Sorbs. The Letts. The Albanians. The Illyrians. The Armenians. The Bakrrians. The Persians. The Caucasic peoples, their language and their tribes 128–143

CHAPTER VI.

THE INSULAR PEOPLES.

The Malays. The Hovas. The Polynesians. The Maoris. The Tongas. The Tahitians. The Pomotonans. The Marquesans. Inhabitants of the Philippine Islands. The Tagalas. The Bisayas. The Ilocanes. The Pampangos. The Igorrotes. The Tingianes. The Apayos. The Bogobos. The Samals. The Andamanese. The Papuans. The Fijians. The Melanesians. Australia and the Australians. The Tasmanians 144–157

Digitized by Google

PAGE

CHAPTER VII.

THE DEVELOPMENT OF CULTURE.

The early condition of man, physically and mentally. His necessities. Origin of culture. Implements and weapons, paleolithic and neolithic. Food. Fire. Language. Writing. Environment 158–182

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MAN:

AN INTRODUCTION TO ANTHROPOLOGY.

CHAPTER I.

THE EARTH'S LIFE-HISTORY AND THE POSITION OF MAN.

CONTENTS.—Matter and force. Inorganic and organic matter. Protoplasm. The Cell. Vegetable and animal forms. Classification. The sub-kingdoms of the animal kingdom. Characteristics of the vertebrata. Characteristics of the mammalia. The order of the primates. The family Hominidæ. The genus homo, and the species sapiens. Anthropology. Special creation. Evolution. The nebular hypothesis. The modification of the earth and the geological stratifications. The age of the earth. The place and time of the origin of man. "Lemuria." Archæological finds bearing on the antiquity of man, from the valley of the Somme, the cave of Aurignac, and the Kitchen-middens. Tertiary man. The Neanderthal skull. The man and woman of Spy. The Naulette jaw. The Pithecanthropus erectus. Living man. The skull. The face. The orbital index. The facial angle. The maxillary angle. The teeth. The pelvis. The limbs. The hair. The color of the skin. The living races of man.

EVERYTHING in the universe is composed of matter, associated with which is force or energy. Matter, on the one hand, so far as we know, cannot exist without force, and, on the other hand, force cannot exist without being identified with matter. By matter we understand to be comprised all substances that occupy space and that are

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appreciable to our senses; and by force we mean that power which produces or increases those motions and changes which occur in material substances.

Matter and force are coëxistent and imperishable, and it is inconceivable to the human mind that one can exist without the other. "Force and matter," says Büchner, "are fundamentally the same thing, contemplated from different standpoints. In the material world we know of no example of a particle of matter not endowed with force or working by it."

This seems to have been recognized long ago by John Hunter, for in his "Introduction to Natural History" he says: "Matter being endowed with properties which become the cause of our sensations, and the modes of action of these properties being hardly known, these properties become the foundation of the idea of spirit, viz., a species of intelligent quality that presides over and directs the actions of matter. But, as causes and effects of matter seem to be entirely connected with matter itself, and to be a property inherent in and inseparable from it, and as these are becoming better known, the 'presiding spirits' are every day vanishing, and their authority becoming less." Hunter, however, in this instance in his reference to "spirit" does not show his usual versatile blunt logic, for, the factor which underlies the idea of spirit more than any other is *consciousness*, which cannot be explained on materialistic grounds.

Matter exists or manifests itself in three different states or conditions, the solid, the liquid and the

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gaseous. It may be changed from the one to the other of these conditions, but it cannot be destroyed or annihilated. Its form may be changed, but not one atom can be destroyed.

Matter is subdivided into inorganic and organic matter. By inorganic matter we understand those substances that are unorganized, *i. e.*, do not possess organs or structures for the performance of any physiological function. Inorganic substances are devoid of life, and in the form of inorganic substances never did possess life, and, of course, never will. Chemically, unorganized substances are composed of many different elements, and are made up of a large number of homogeneous parts, which have no definite relationship to each other. Inorganic substances have no definite form, and are said to be "amorphous," or they may be "crystalline" when they are bounded by plane surfaces and straight lines. Inorganic substances do not grow, in the true meaning of the word, but may increase in size by "accretion" or additions to the outside.

All organic bodies are composed fundamentally of structures which are denominated to be *cells*. These cells are mostly microscopic in size and were first discovered in plants by Mathias Schleider in the year 1838, and shortly afterwards Theodor Schwann showed that the same structures were the basic elements of the animal body.

A cell is composed of protoplasm which consists mainly of protein which is composed chemically of the elements of carbon, hydrogen, oxygen and nitrogen; sometimes sulphur is present, and associated

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with these is a considerable proportion of water. Surrounding this protoplasm of the cell there is usually a portion thereof which is termed the cell wall, and there is usually a well-defined structure in the center which is called the nucleus.

The tendency of all cells is to assume the spherical in shape, but this is variously modified by pressure. Many of the lower plants and animals consist of but a single cell, which cell in its own environment is competent to perform and does perform all of the necessary functions of life. In the higher plants and animals there is a unity which results from the fusion of the two-sex cells, and by continued division growth is accomplished. The study of cell-structure and formation since the discovery of cells was made, has added much to our knowledge of life and has also been of great practical value to mankind, for upon the cellular theory is founded our knowledge of cellular pathology.

Organic bodies possess organs or structures for the performance of the physiological functions of life. In the lowest types of organic life distinct organs do not exist, but, nevertheless, the different physiological functions are performed. Organized bodies are fundamentally composed of a few chemical elements into quite complex combinations. They are composed of heterogeneous parts, among which there is always more or less definite relationship. These forms are always of a definite shape, the surfaces of the body being bounded by curved lines, either convex or concave. Organic substances grow, in the true meaning of the word; that is, they increase in size by the intussusception of matter.

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Organic bodies are divided into plants and animals. In the case of the higher vegetable and animal forms, when a comparison is made the differences are quite obvious. As an illustration, consider the deer that is browsing on the grass; one would at first thought consider resemblances between the two to be out of the question. Many points of difference may easily be noted; the animal has a nervous system, a vertebral column, a gastro-intestinal tract, and the power of locomotion, as well as many other faculties that the plant is entirely without. All of these differences, however, gradually fade away as we trace the probable ancestral lines of the two down to the primitive forms of life, and then make the comparison. In the case of the lowest forms of organisms the absolute differentiation of plant and animal is an impossibility, and hence Prof. Haeckel has proposed an intermediate kingdom which he calls the *Regnum protisticum*, in which to place these doubtful forms. The study of life in general is comprised in the science of *Biology*, which includes *Botany*, which treats of the vegetable world, and *Zoölogy*, which has for its consideration the animal kingdom.

Animals may be studied primarily from two different standpoints, the morphological and the physiological. *Morphology* treats of the structures which constitute the internal form of the animal; and *Physiology*, which relates to the different functions performed by the various parts of the animal. All animals perform the functions of *relation*, *nutrition* and *reproduction*, and all pass through the

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different stages of *waste* and *repair*. In the first stage, repair is in excess of waste; when the second stage is reached, waste and repair are equal; and, lastly, the third stage is when waste exceeds repair, the assimilated material being insufficient to keep up the processes of life, and hence the death of the individual is the result.

The variety and number of living animal forms are so great that in order to study them and appreciate the results of such study, some system is necessary; and in order that we may accomplish this we have these diverse phases of animal life divided into a number of groups, according as they bear more or less resemblance to one another. The arrangement of these groups constitutes classification.

The animal kingdom is divided into eight great plans of structure, and the divisions thus formed are designated "sub-kingdoms." In these, from the lower to the higher, we find a progressive increase in complexity, from one end of the series to the other; this series, however, does not constitute a linear one, as the highest organism of each is never directly related to the lowest organism of the next higher sub-kingdom. It is usually more highly developed and specialized, and so it can be seen that the sub-kingdoms overlap, as it were, one another.

The sub-kingdoms are divided into classes; the classes into orders; the orders into families; the families into genera, and the genera into species, the species constituting the zoölogical unit upon which all divisions are made.

Of these eight sub-kingdoms the lowest, and

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hence the first to be considered, is the *Protozoa*. As the name implies, this group includes the most lowly organized forms of the entire animal series. Some of these animals consist of undifferentiated protoplasm, and are of extreme simplicity. They do not possess a body cavity, nor are any traces of a nervous system to be found. As a rule the Protozoa are aquatic in their habits and microscopic in size, although they sometimes form colonies. The simplest of all known animal forms, called Monera, belong to this sub-kingdom. "The entire body of one of these Monera," says Haeckel, "during life is nothing more than a shapeless, mobile little lump of mucus or slime, consisting of an albuminous combination of carbon. We assume that this homogeneous mass has a very complicated and fine molecular structure; however, this has not been proven either anatomically or with the aid of the microscope. Simpler or more imperfect organisms we cannot possibly conceive." Important classes in this sub-kingdom are the Rhizopoda, the Gregarinidæ and the Infusoria.

Sub-kingdom 2. *Polystomata*, includes an interesting series of forms, the sponges, which some observers still consider to be of vegetable nature. The sponges have an internal body cavity, with a wall composed of three primary layers. In most of these forms there is one outlet and many inlets, but, while consisting of many cells, there are no differentiated organs.

Sub-kingdom 3. *Cœlenterata*, includes those animals whose alimentary canal communicates freely

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with the general cavity of the body. The body is composed of two layers—an outer, called the ectoderm, and an inner, called the endoderm. In the majority of the cœlenterata there are no traces of a nervous system. The jelly-fishes and sea-anemones are members of this sub-kingdom. Both of these forms possess a radiate symmetry.

Sub-kingdom 4. *Echinodermata*, includes the sea-urchins, the star-fishes and the sea-cucumbers. In the larval condition there are traces of a bilateral symmetry, but in the adult they show a radiating symmetry. An internal body cavity is always present. There is a nervous system arranged in the form of a ring around the mouth, from which nerve filaments pass to different portions of the animal. Some of the echinoderms show certain pigment spots, which have been supposed to be simple eyes. Calcareous matter is deposited in the skin, giving it a hard consistency. There is also a system of water tubes, the "ambulacral system," by which locomotion is greatly facilitated.

Sub-kingdom 5. *Vermes*, includes the worms, the internal structure of which is quite variable, bilateral symmetry being the most general character. There is a nervous system present in most forms. All worms possess a water-vascular system. A number of these forms are parasitic, living within the bodies of higher animals. The lower forms are not segmented, but the higher ones, the annelids, consist of a series of homologous segments.

Sub-kingdom 6. *Mollusca*, includes those soft-bodied animals possessing a leathery mantle or shell,

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composed of carbonate of lime, which serves as a protection to the animal. The oysters, the whelks, the snails and the cuttle-fishes belong to this division. Many of the lower mollusca form colonies by continuous gemmation, but the higher forms are all simple animals.

Sub-kingdom 7. *Arthropoda*, includes those animals which have bodies composed of successive segments or joints, and which are covered by a hard external layer composed of chitin, and known as the exoskeleton. The arthropods are bilaterally symmetrical. The forms included in this sub-kingdom are the crabs, the lobsters, the spiders and the insects.

Sub-kingdom 8. *Vertebrata*. The animals included in this sub-kingdom are the fishes, the amphibians, the reptiles, the birds and the mammals.

All vertebrated animals possess at some period of their existence a cartilaginous structure running along the dorsal region of the body, called the "notochord" or "chorda dorsalis." In some forms the notochord is persistent throughout life, but in the majority of cases it is replaced by the vertebral column or backbone.

On cross-section, the body of a vertebrated animal may be considered to resemble two tubes, the smaller being above and the larger beneath. Between these tubes we find the notochord. The smaller tube contains the cerebro-spinal nervous system, and the larger tube contains the alimentary canal, the organs of circulation, etc., and also portions of the nervous system known as the "ganglionic" or

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"sympathetic" system. In the invertebrated animals the body consists of but a single tube, and this includes all of the viscera. The main portions of the nervous system in the vertebrated animal are situated in the dorsal region. The vertebrata are bilaterally symmetrical. The segmented arrangement of many of the invertebrates is present to a certain extent, as is seen by the examination of their bones, and as may be more clearly recognized in their embryology. This segmentation is, however, greatly obscured in the adult by the arrangement of the soft tissues.

The limbs are never more than four in number and are arranged in pairs; they are in some instances altogether wanting or but partially developed; but never more than two pairs are present. These limbs are variously modified, as the paired fins of fishes, the wings and legs of birds, the fore and hind legs of quadrupeds, or the arms and the legs of man; all of these are but modifications of the one type, which modifications are generally recognized to have been the result of the effect of the environment under which these different animals have existed, and of the different functions that have been performed.

All vertebrates possess a specialized circulatory system, and in all except one—the *Amphioxus lanceolatus*—there is a heart, which consists of either two, three or four chambers. The hepatic portal system is a peculiar modification of the venous system of bloodvessels which is found in all of the vertebrates. The lacteal system, which is considered

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to be an appendage of the venous system, which takes up and elaborates the products of digestion and finally empties the contents into the veins, is also present.

All vertebrated animals have a mouth, and in the majority of instances teeth are present; an œsophagus is also found, and in some cases a crop (ingluvies) and fore-stomach (proventriculus); next come the stomach, intestines, cloaca and vent. Appended to the alimentary canal are a number of glands, which act upon the food and prepare it for assimilation. The salivary glands secrete the saliva; the gastric juice is secreted in the stomach; the liver secretes the bile; the pancreas secretes the pancreatic juice, and in the mucous membrane of the intestine are found certain glands which secrete intestinal juice.

Respiration is accomplished in fishes and larval amphibians by means of gills, but the adult amphibians and other land vertebrates breathe by means of special cellular sacs, called lungs.

In all of the vertebrates reproduction is accomplished by means of the sexes, and in no instances do we find the two sexes in a single individual. Among the vertebrates no animal possesses the power of reproducing itself by fission or gemmation.

The so-called special senses of sight, hearing, smell, taste and touch are probably always present among vertebrates, although the degree to which these senses are developed may vary considerably.

In the vertebrata we find that the skeleton may be considered as consisting on the one hand of those

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bones which go to form the head and trunk, and thus forming a sort of axis, and hence known as the *axil* skeleton; and, on the other hand, of those bones which form the support for the limbs or appendages, and hence called the *appendicular* skeleton. The head and trunk may be considered as consisting of a series of bony segments arranged longitudinally, one following the other. The skull, which is situated at the anterior portion of this series of segments, is much modified to form the large bony chamber which receives the brain. While there is still some difference of opinion as to the formation of the skull, the tendency among comparative anatomists is, nevertheless, to consider that it has been formed by a modification of separate segments.

The lower jaw, or inferior maxillary, is present in nearly all of the vertebrates, and consists of two halves or *rami*, which are united anteriorly, but posteriorly articulate separately with the skull. In some instances each ramus consists of several pieces united by sutures, but in the mammalia each ramus consists of but one piece. The two rami are sometimes united anteriorly by ligaments, by cartilage, or there may be a bony union. In the reptiles and birds the inferior maxillary does not articulate directly with the skull as in the mammalia, but through the intervention of a third bone known as the quadrate bone, or *os quadratum*.

Each separate bony segment which goes to make up the vertebral column is called a *vertebra*; collectively they are known as vertebræ. The anterior

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part of a vertebra is known as the *centrum* or *body;* attached to the centrum posteriorly is a ring or arch, which is formed by two lateral projections or *processes*. These processes, on meeting behind, form the *spinous* process. The arches form with the centrum a ring through which passes the spinal canal. Owing to this circumstance the arch is spoken of as the *neural arch*, the ring as the *neural canal*, and the spinous processes as the *neural spine*. Coming off from the neural arches are two processes called the articular processes. Two lateral processes called the transverse processes come off from the sides of the body of the vertebra at the junction with the neural arches.

The comparative anatomist recognizes a second arch, which, owing to the modification the parts have undergone, is not as clearly recognized as the neural arch. This second arch is the *hæmal arch*, which contains the organs of circulation, the alimentary canal and the accompanying structures. This hæmal arch is formed by the ribs, the costal cartilages and the breastbone, or *sternum*, which, in some cases, as in most of the birds, develops a spine —the *hæmal spine*—which corresponds to the neural spine on the opposite side. In the higher vertebrates the spinal column is divided into several different regions, namely, the *cervical*, the *dorsal*, the *lumbar*, the *sacral* and the *caudal* or *coccygeal*, all named according to the position they occupy in the series.

The fore limbs are attached to the trunk by means of three bones—the *scapula*, the *coracoid*,

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and the *clavicle*—and these bones constitute a group which is frequently known as the *pectoral* or shoulder arch. The clavicle is in many instances absent, and the coracoid is not always a separate bone. The hind limbs are connected in essentially the same manner by means of three other bones, the *ilium*, the *ischium* and the *pubes*, which, collectively, are known as the *pelvic* arch; these three bones are frequently ossified together, and they then form what is known as the *innominate* bone.

The fore limb consists of a single long bone, the *humerus*, succeeded by two long bones, the *radius* and the *ulna;* these are followed by two rows of small wrist bones, which constitute the *carpus;* the carpus is succeeded by the *metacarpus*, the bones of which support the digits. The homologous structures in the hind limb are the *femur*, the *tibia* and *fibula*, the *tarsus*, the *metatarsus* and the *phalanges*. All of these bones show considerable variation in the different vertebrates; sometimes there is a bony union between certain bones which are usually separate; at other times certain of these bones may be absent.

The sub-kingdom vertebrata is divided into five different classes, as follows: the *Pisces* or fishes, the *Amphibia*, the *Reptilia*, the *Aves* or birds, and the *Mammalia*. It is with this last and highest class, the *Mammalia*, that we are at present particularly concerned.

The mammalia include all those viviparous, warm-blooded animals which nourish their young by means of a special fluid, the milk, which is secreted

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by special glands, the mammary glands. At some period of their life they are always covered with hair. The lower jaw always articulates directly with the skull, and there are always two occipital condyles. The thorax is separated from the abdomen by means of a large muscle, known as the diaphragm. The cerebral hemispheres are connected by a transverse commissure, the *corpus callosum*. The heart consists of four chambers, two auricles and two ventricles, the pulmonary and systemic circulations thus being completely separated. The single aorta is reflected over the left bronchus.

Except in the aquatic mammals—the cetacea and the sirenia—the vertebral column is divisible into the same regions as in man. The usual number of cervical vertebræ is seven. In the dorsal region there are from ten to twenty-four vertebræ; the usual number is thirteen; in man there are twelve. In the lumbar region there are from two to nine vertebræ; the usual number is six or seven; in man there are five. The sacral vertebræ are usually anchylosed into a single bone, the *sacrum*. The caudal vertebræ vary greatly in number; in some bats there are only three; in man and some of the higher apes there are four, and in some other forms there are thirty. In man this caudal region is known as the *coccyx*.

In the mammalia the skeleton varies, particularly in the limbs. The scapula is always present in all of the different members of this division. The coracoid bone, which is an important structure in birds, is only found as a separate and distinct bone

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in one order of the mammalia, the monotremata. In all of the other mammals it is attached to the scapula, and forms the coracoid process. The clavicles are never united to form a furcula or "wish-bone," as in the birds; and they are only present in those mammals which use their anterior limbs for flight, for digging, or for prehension.

The humerus is always present in the mammalia. The radius and ulna are always recognizable, although they are sometimes to an extent united; in the bats the ulna may be absent.

The number of bones entering into the formation of the carpus varies in the different mammals from five to eleven; in man there are eight.

The metacarpus is, as a rule, composed of five bones. In the ruminants and in the horse there is but a single metacarpal bone, but the embryology and paleontology of these forms show that at one time there were a large number.

The digits vary from one to five; the latter being the typical number. Karl Gegenbaum first pointed out in the year 1864 how the five-toed forms of land vertebrates originated probably from the radiating breast fin of the ancient carboniferous fishes; the middle one is the longest, and the thumb is frequently absent. As a rule each digit has three phalanges, except the thumb, which has but two. The ability to oppose the thumb to the rest of the digits is found particularly well developed in man, although it is present to a limited extent in the anthropoid apes.

The posterior limbs are present in the majority of

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the mammalia. The pubic bones in nearly all mammals are united to form the ossa innominata in the adult, although in the embryo they are separate bones, the ilium, the ischium, and the pubes.

In man the femur is the longest bone in the body, while in the other mammals it is relatively much shorter. The tibia and fibula are, as a rule, separate bones, although in some instances they are found united. The tibia corresponds to the radius anteriorly, as may be recognized by the fact that it supports the tarsus. The tarsus consists of from four to nine bones in the various mammals; in man there are seven. In the majority of instances there are five metacarpal bones and five digits, but this is subject to frequent variation, as are the corresponding structures of the anterior limb.

Nearly all of the mammals are supplied with teeth, which are arranged in one row, and, with the single exception of the monotremata, always in sockets. There are usually two sets of teeth; the first, or milk set, are soon lost, and are succeeded by the second or permanent teeth. These teeth are divisible into four different groups, which differ from one another in their position, appearance and function. These are the *incisors*, *canines*, *premolars* and *molars*. All of these teeth are not necessarily present in all mammals, and as there is considerable variation in their number and form, they furnish in many instances a valuable key for classification. The zoölogist expresses the number and arrangement of the teeth in a set formula; the dentition of adult man is expressed thus:

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$$I\frac{2-2}{2-2},\quad C\frac{1-1}{1-1},\quad P\frac{2-2}{2-2},\quad M\frac{3-3}{3-3} = 32.$$

The initial letter indicates the name of the teeth, and following this is the number; those of the upper jaw being expressed by the numerator, and those of the lower jaw being expressed by the denominator.

Systematic zoölogists have divided the mammalia into numerous orders from 12 to 32 in number, the higher numbers being represented when the extinct forms are considered; but the three natural groups proposed by Bainville in the year 1816 are still sound as sub-classes: the monotremata; the marsupialia, and the placentalia. These sub-classes not merely present important differences in their anatomy, but, historically, three different geological periods are correspondingly represented. The monotremes perhaps originated during the triassic period. The earliest marsupials have been found in the jurassic, and in the cretaceous periods the earliest placentals have been found.

Many classifications of the mammalia have been made, but no one arrangement has been universally adopted by zoölogists. All divisions are, of course, arbitrary ones, as the differences found in nature are all differences of degree and not differences of kind. For convenience, however, the following orders may be considered as comprising the living animals of the class mammalia:

Order 1. *Monotremata.*—In the animals of this order the ureters and ducts from the reproductive

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organs open in common into a urogenital canal, which with the rectum opens into a "cloaca." The testes are abdominal, and the mammary glands are without true nipples. The marsupial bones are present, but there is no pouch. Included in this order are two remarkable forms found in Australia, the *Ornithorhynchus* and the *Echidna*.

Order 2. *Marsupialia* are characterized by the fact that the female usually possesses a pouch or marsupium, in which she carries her young, which are born in a very imperfect condition. The uterine ends of the oviducts with the ureters open into a urogenital canal, which is distinct from the rectum, although included in the same sphincter muscle. The marsupial bones are present and are well developed. In this order are included the kangaroos and the opossums.

Order 3. *Edentata*.—The absence of the median incisors, sometimes all of the incisors, characterizes this order. Occasionally the canines and also the molars are absent. The dentition in this order is very incomplete and very variable. Included here are the sloths, armadillos and the great ant-eater.

Order 4. *Sirenia*.—Includes the dugongs and the manatees, mammals which are adapted for an aquatic life. The hind limbs are absent and the fore limbs are modified into swimming paddles. The nostrils are two in number and are situated on the upper part of the snout. The tail fin is expanded horizontally.

Order 5. *Cetacea*.—Includes the whales and the dolphins, which are also mammals modified for an

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aquatic existence. The fore limbs are the only ones present and these are modified into swimming paddles. The nostrils are situated on the top of the head, and the mammary glands are situated in the region of the groin.

Order 6. *Ungulata*.—The animals of this order are characterized by the fact that there are never more than four full-sized toes to each limb and that these are covered by expanded nails, forming hoofs. There are no clavicles present. This order includes all of the hoofed quadrupeds, and the ruminants, as horses, oxen, tapirs, rhinoceroses, hippopotami, camels, llamas, deer and a number of others.

Order 7. *Hyracoidea*.—Includes the single genus *Hyrax*, or coney of Syria and Palestine. The canines are absent and the incisors grow from persistent pulps. There are no clavicles present.

Order 8. *Proboscidea*.—The elephant is the only living form in this order. The upper incisor teeth grow from persistent pulps and form tusks. There are no clavicles present. The nose is modified into a proboscis or trunk.

Order 9. *Carnivora*.—This is a large order and includes all of the well-known beasts of prey, as lions, tigers, cats, dogs, wolves, foxes and others. They all possess three different varieties of teeth, *viz.*: incisors, canines and molars. All of these teeth possess sharp cutting edges rather than crowns for the grinding of the food. The clavicles are quite rudimentary. The seals and walruses, which can almost be considered as leading a semi-aquatic existence, belong to this order.

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Order 10. *Rodentia.*—Includes those forms where the incisor teeth grow from persistent pulps throughout the entire life of the animal. There are no canine teeth present. The beavers, rats, mice, squirrels, rabbits, and some others belong to this order.

Order 11. *Cheiroptera.*—Includes the bats, in which forms the four outer or ulna fingers are greatly developed and elongated and are united by a membrane or patagium, which is continuous from the side of the body and the hind limb. Owing to this modification, bats possess the power of flight. Well-developed clavicles are always found present in these forms.

Order 12. *Insectivora.*—Includes the moles, shrew-mice and hedgehogs. They are all of small size, and possess strong claws, which are used for burrowing. They have tapering mouths and many sharply-pointed teeth; the canine teeth, however, are either small or absent. There are clavicles present.

Order 13. *Primates.*—The order of the primates includes the most highly organized members of the entire animal series: the lemurs, the monkeys, the apes and man. They all have opposable thumbs on some of the extremities, and, with the exception of the marmosets, they all have flat nails instead of claws. The dental formula is usually:

$$I\frac{2-2}{2-2},\ C\frac{1-1}{1-1},\ P\frac{2-2}{2-2},\ M\frac{3-3}{3-3} = 32.$$

The brain is proportionally more developed than

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the brain of other animals, and the fore limbs are mainly used to wait on the head, *i. e.*, prehension.

The primates are divided into two sub-orders: the *Prosimiæ* and the *Anthropoidea*. The first group includes the lemurs. They vary from the size of a rabbit to that of a monkey. The body is entirely covered with thick fur; when walking they go on all four feet, and they usually possess long tails. At the present time the distribution of the lemurs is limited to Madagascar, Eastern Asia and South Africa; in earlier times their distribution was probably more extensive, as the bones of forms apparently of this type from the eocene beds of the Rocky Mountains have been described by Cope and Marsh.

The sub-order Anthropoidea are "characterized by the large, convoluted cerebral hemispheres, which nearly, or in the higher apes and man, conceal the cerebellum when seen from above. The ears are rounded, with a distinct lobule, and the two mammæ are pectoral." (Packard.)

They are divided into two subdivisions; the first includes the monkeys and the apes, and the second includes only man.

The American monkeys have an additional premolar tooth on each side of each jaw. They usually have prehensile tails, and the thumb of the hand is not well developed; in the spider-monkeys it is absent. Their nostrils are separated by a very wide partition, and are hence called *Platyrrhinæ*. They live in troops mostly in the forests of Brazil.

The Old World monkeys and apes have a narrow

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nasal septum, and are hence said to be *catarrhine;* their dentition is the same as that of man, and their tails when present are never prehensile. The monkeys commonly seen in menageries are the macaques of India. The baboons have elongated jaws, cheek pouches and callous patches upon which they sit. The only species now living in Europe is the Barbary ape. In the sacred monkey of India and the thumbless Colobus of Africa they have no cheek pouches, the stomach is more complex and they possess long tails and callosities.

The highest members of this group are the anthropoid apes. They possess no tails, callosities nor cheek pouches. They live mainly in trees, at times, however, walking on the ground, sometimes in a semi-erect posture. The gibbon, the orang-outang, the chimpanzee and the gorilla belong to this group. The gibbons in many respects resemble the monkeys; they are less than 3 feet in height and are slender and agile; when erect, their fingers touch the ground; they possess fourteen pairs of ribs. They belong to the fauna of Southern Asia. The orang-outang is from 4 to 4½ feet in height and has twelve pairs of ribs, and lives in Borneo and Sumatra. The chimpanzee and the gorilla inhabit the west coast of Africa. The chimpanzee stands about 5 feet in height and has fourteen pairs of ribs; it lives in trees and eats mainly fruit; they travel, as a rule, in groups. The gorilla sometimes attains a height of 5½ feet and weighs nearly 200 pounds, being of prodigious strength; it has, like the chimpanzee, fourteen pairs of ribs; its habits of life in general resemble those of the chimpanzee.

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Man was first placed among the Primates by the great naturalist Linnæus, and belongs to the family *Hominidæ*. When Linnæus thus classified man none disputed it to any extent until the time of Darwin, when the anti-evolutionary philosophers, in their courageous but unwise attempts to refute evolution, endeavored to separate man from animate nature as much as possible, and place him in a little hierarchy of his own. However, naturalists are now quite agreed that the anatomical characteristics possessed by man are such that he without question should be placed in the order of the Primates, and that he belongs to that particular family of the Primates denominated the Hominidæ.

In this family locomotion is easiest in the erect position; the thumb is opposable to the other fingers; the great toe can grasp only by approximation and not by opposition. The muscles which keep the body erect, such as those of the back, the extensors of the hip-joint, and the muscles of the calf of the leg, are much more developed proportionally than the corresponding structures in the monkeys and apes. The vertebral column of man presents a series of curves, which results in the centre of gravity falling between the feet. The family Hominidæ is usually considered as comprising only the genus *Homo* and having but the single living species *Sapiens*.

The study of man as a species constitutes the science of Anthropology.

The anthropologist studies man as an animal; and although he possesses certain traits which are

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exclusively human, he is still, nevertheless, an organized being and subject to the same laws and conditions of other organized beings. He is in certain respects the superior of all other animals, but in other respects he is their inferior.

The physiologist, being unable to perform his experiments upon man, experiments upon the lower animals, and from the results thus gained deduces what the effect would be upon the human subject. So it is with the anthropologist. When he observes any characteristic in man, anatomical or otherwise, the explanation of which is not self-evident, he endeavors to observe the same characteristic in the lower animals, and thus, by studying the subject comparatively, important results are frequently obtained.

The first consideration that confronts us in the study of man is the question of his origin. The two ideas held at the present time are that man originated through Creation or Evolution.

Those believing in the *Doctrine of Special Creation* believe that man and all other species have been specially created in their present form at some point within their present geographical habitat, and that variation exhibited by them is within certain definite limits, and that it is not sufficient to produce new species.

The *Doctrine of Organic Evolution* teaches that man and all of the other organic forms are not separate creations, but that each bears a certain definite relationship to all other forms; that all organic forms undergo modifications, and that all

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of our present plants and animals are the descendants of pre-existing plants and animals.

The factors of organic evolution, as advanced by Darwin, and commonly referred to as the Darwinian theory, are as follows:

(1) All species of animals and plants exhibit tendencies to variation from the parent stock. This may be readily observed in the young of any of our domesticated animals; never do we find the young absolutely similar to the parents. These variations, however slight, are of importance, and, through heredity, are transmitted to succeeding generations. It is of importance to remember that no two individuals are exactly alike in all particulars.

(2) The environment under which all organic forms are placed is not an absolutely unchanging one, but it is continually varying, and the organic forms are thus placed constantly under different conditions. This modification of external conditions requires a corresponding modification on the part of the organism. This modification may be anatomical or otherwise, but modification there must be; if it does not occur, the extinction of the organism, or, ultimately, even the species, is the inevitable result.

(3) All organisms produce more progeny than can possibly survive, hence a process of natural selection ensues, in which those that possess any favorable variation, adapting them more perfectly to their environment, survive; while those which do not possess the favorable characteristics are placed at a disadvantage in the struggle for existence, and will in time perish.

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(4) The results of continued use and disuse are also factors of importance in organic evolution. It is well known that the continued use of an organ or structure tends to its enlargement, while continued disuse, on the other hand, results in its atrophy or degeneration. This was first pointed out by Lamarck, and has since been verified by many naturalists. The late Prof. E. D. Cope has thoroughly illustrated this factor in many of its important bearings, in his work on the "Origin of the Fittest."

The value of any theory may to an extent be measured by the number and the importance of the facts which it is able to explain, and, furthermore, when a natural explanation can be given for any phenomena we should not resort to a supernatural explanation. This was first insisted upon by Sir William Hamilton, and it constituted what he denominated to be the "Law of Parsimony." The hypothesis of organic evolution affords the most natural explanation that has ever been offered to explain the origin of the various species and other groups of both vegetable and animal life; and this theory is based upon the most thorough investigation as to the structure and the life-history of organic forms.

The credit for the recognition of the theory of organic evolution belongs largely, of course, to Charles Robert Darwin, but, at the same time, we should recognize that there were several other investigators in the field of natural science before his time to whom great credit belongs for having appreciated certain significant morphological relationships

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and physiological factors of great importance in the development of life along the lines of what later became the development theory.

The distinguished French naturalist Jean Lamarck in the year 1809 published his *Philosophie Zoölogique*. In this work it is easy to find many ideas which distinctly foreshadowed our present ideas of organic evolution. He clearly recognized that adaptation to environment was a cause of morphological modification. He also considered that habit as to the use and disuse of structures to be a factor of great importance in the modification of the animal structure. He was one of the earliest naturalists to recognize that, in the origin and classification of animals we cannot have a linear genetic series continuing from the lower to the higher with all animal forms included therein; but that relationships must be shown by a branching genealogical tree in which the highest forms of one group of animals may not necessarily be closely allied to the lowest forms of the next higher group.

Johann Wolfgang Gœthe, the distinguished poet-naturalist, who is generally remembered only as the author of *Faust*, made some contributions to natural science that will always be remembered. He gave especial study to the theory of homologies and recognized the importance of the recognition of the unity of type in related groups. In the year 1790, his *Metamorphosis of Plants* was published, in which he considered that all of the parts of a flower are modifications of a type which is most clearly seen in the leaf. This is decidedly evolutionary.

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His theory as to the vertebral origin of the structure of the skull was recognized to be of great importance to comparative anatomy, although it has since been greatly modified by other investigators.

In November, 1859, Darwin's work *The Origin of Species by means of Natural Selection* appeared, and it at once attracted the attention of students not merely of the biological sciences but also of all other departments of knowledge; for the reason that those factors which have been operating in the production of the various life-forms are such that apply not merely to organic things, but also to the various kinds of knowledge and invention as have been developed by mankind. Thus we refer to the evolution of art, science, and literature, and also to the many sub-divisions of these subjects. Associated with Darwin in this connection was Alfred Russel Wallace, who had spent years as a field naturalist in the Malay Archipelago and who, independently of Darwin, had himself recognized the theory of Natural Selection. In the year 1858, Wallace sent his views to Darwin with the request to present them to Sir Charles Lyell. Darwin had written a preliminary sketch of his theory in the year 1848 but had never published it. Sir Charles Lyell and Sir Joseph D. Hooker had long been familiar with Darwin's work, and they induced him to publish an extract of his work along with the paper by Wallace. Both papers appeared simultaneously in the *Journal of the Linnean Society* for August, 1858.

For evolution to have succeeded in producing

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the innumerable varieties of organic life, so diverse and so numerous, including both the vegetable and the animal, forms not only living at the present time, but also forms long since extinct, and which are now exhumed from the beds of the earth, where they have been for ages, that they may give the testimony of their history; for these changes to have occurred, a long period of time in the life-history of the earth must have been necessary. Have we any evidence to indicate that sufficient time has existed?

The universal testimony of modern science is that our earth is very much older than it was previously supposed to be. According to the nebular hypothesis, which at the present time is quite generally accepted, the sun, the earth, and all of the other planets consisted at one time of one great mass of gaseous matter, such as the faint nebulæ that astronomers observe at the present time. It is considered that the original nebula that comprised our present sun and planetary system, continually rotating on its own axis, gradually condensed, and from its mass successive portions were thrown of which subsequently became those bodies we speak of as the planets. These planets, slowly condensing and cooling, continued to revolve around the sun, which itself is slowly but surely cooling and condensing. This theory explains in a satisfactory manner the reason why the earth and the other planets are so closely related to and dependent upon the sun. It also explains why the interior of the earth is still hot.

When the earth passing through these different

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changes and conditions had sufficiently cooled, condensation began and various changes occurred, each previous change rendering succeeding events possible. The rocks that formed the original crust of the earth are spoken of as being igneous in origin, because they were formed under the action of heat. Through the agency of water these igneous rocks were to an extent worn away and subsequently again deposited. Many and various were the phenomena that occurred; and gradually, not suddenly, the nature of things underwent modification.

The earth is constantly undergoing changes. Through the mighty agency of water the land is especially modified. Every spring, rivulet and stream is charged with a certain amount of solid material or sediment which is being carried ultimately to the sea. The amount of solid material in any stream depends on a number of circumstances; thus the character of the substance is a factor, and the depth, velocity and general character of the stream are others. When the stream or river reaches the sea the solid material it contains is deposited in layers, which by geologists are termed strata.

The following are the different periods of geological time that are recognized by geologists: the oldest rock formations and those which were igneous in origin, forming the original primitive crust of the earth, have been called the *Primeval.* Whether any rocks of this character can now be recognized is very doubtful. The oldest of the sedimentary rocks, or those deposited through the

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agency of water, are the *Archæan;* they do not show positive evidences of contemporaneous life, although it is highly probable that life existed at this time. The next period is the *Cambrian*, and this was abundantly supplied with primitive life forms; molluscs, crustaceans and the trilobites were quite abundant. The succeeding period was the *Silurian*, in which the mollusca were particularly abundant, and, in addition to these, the animals of the highest type—the vertebrata—first make their appearance in the form of the earliest fishes; the coral-forming animals also seem to have been abundant at this time. The succeeding period, the *Devonian*, is called the "age of fishes," as, during this period, the cartilaginous and ganoid fishes were quite common, although the more highly organized bony fishes had not as yet evolved. During this time vegetation was also quite abundant. During the next epoch, the *Carboniferous*, vegetation was luxuriant, this being the great coal-bearing period. The amphibians now first appeared, and giant forms of the salamander type flourished. In the succeeding period, the *Permian*, the reptiles had evolved, and this is referred to as the "age of reptiles." Next comes the *Triassic* period, which is of particular importance, owing to the circumstance that during this time members of the class Mammalia lived, remains of which, in the form of marsupials, have here been found. The other life forms in general show also a progressive development to have taken place over those organisms which lived during the preceding periods.

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	Epochs.	Faunal Characters.
Cainozoic or Tertiary.	Post-Pliocene Glacial	Man. Mammals of living species. Mollusca recent.
	Pliocene, 3,000 feet	Mammals of recent genera. Living species rare. Mollusca very modern.
	Miocene, 4,000 feet	Mammals of living families; many extinct genera. Mollusca largely of recent species.
	Eocene, 10,000 feet	Mammals of numerous extinct families and orders. All the species and most of the genera extinct. Modern type shell-fish.
Mesozoic or Secondary.	Laramie, 4,000 feet	Passage beds.
	Cretaceous, 12,000 feet Chalk	Dinosaurian (bird-like) reptiles, pterodactyles (flying reptiles), toothed birds, earliest turtles, ammonites.
	Jurassic, 6,000 feet	Earliest birds, giant reptiles, ammonites, clam and snail shells. Decline of brachiopods. Butterfly.
	Triassic, 5,000 feet New Red Sandstone	Earliest mammal (marsupial), two-gilled cephalopods, reptilian footprints.
Palæozoic or Primary.	Permian, 5,000 feet	Earliest true reptiles.
	Carboniferous, 26,000 feet Coal	Earliest amphibian. Extinction of trilobites. Earliest crayfish, beetles, cockroaches, centipeds, spiders.
	Devonian, 18,000 feet Old Red Sandstone	Cartilaginous and ganoid fishes. First land and fresh-water shells; shell-fish; decline of trilobites; May-flies; crab.
	Silurian, 33,000 feet	Earliest fish; first air-breathers (insect scorpion); brachiopods and cephalopods; trilobites; corals.
	Cambrian, 24,000 feet	Trilobites; brachiopod molluscs.
Azoic.	Archæan, 30,000 feet Huronian Laurentian	Eozoon (probably not a fossil),
	Primeval	Non-sedimentary.

The *Jurassic* period comes next, and here have

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been found the earliest remains of birds which have many reptilian characteristics. The reptiles also possessed many avian characteristics, as the power of flight; and they, in some instances, were forms of gigantic size. The following period was the *Cretaceous*, during which age many bird-like reptiles still lived, and birds possessing teeth were common. True bony fishes abounded and the mammalian type flourished. During the Jurassic and Cretaceous periods the differentiation of the Vertebrata probably largely occurred, as paleontology so abundantly supplies forms from these formations which bridge over the differences of structure in the different classes of the vertebrata, showing that the relationships existing between these classes during these periods were very close. The succeeding formations, the *Eocene*, the *Miocene*, the *Pliocene* and the *Post-Pliocene*, show a continuance of the evolutionary process, higher forms being found in each succeeding formation; and finally in the last, man appears, although it is possible that future research may establish an earlier date for his origin.

During this last period there also occurred another event of great importance, which is known as the *Great Ice Age* or the *Glacial* period, owing to the circumstance that in the northern hemisphere, and perhaps also in the southern, large portions of the earth were covered by mighty glaciers, thousands of feet in thickness and which necessarily greatly affected all forms of contemporaneous life.

These periods, here so briefly outlined, constitute

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the epochs through which the earth has passed and during which evolution has operated to produce the present forms of life. It must not be inferred that the causes that produced these great changes have ceased to operate, for such is not by any means the case. The factors of nature that have operated in the past are still at work to-day, and it is inconceivable that they should cease to be the factors of the future.

It is by the study of the different stratifications and the fossils contained therein that geologists are enabled to estimate approximately their age. It has been calculated that a period of more than a million years was necessary for the formation of the carboniferous strata, the coal-bearing period requiring probably at least 600,000 years. The eminent naturalist, Humboldt, considered that a period of nearly 1,000,000 years was necessary for the formation of the guano deposits, which are composed of the excreta of sea birds. On the authority of Croll, the last glacial period ended at least 100,000 years ago. If these periods separately consumed such long durations of time, collectively the time required must have been enormous, far beyond anything the mind can conceive of. Sir Charles Lyell considered that a period of 560,000,000 years must have been necessary. Other scientists consider that 100,000,000 years is sufficiently long for the deposition of all of the different stratifications of the earth's crust, from the earliest to those of the present time.

While there are many estimations of geological time made, and while the opinions expressed are

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diverse, they all, nevertheless, agree in the one important particular that the different changes through which the earth has passed to reach its present condition must have required immense periods of time, far beyond anything of which we can conceive.

The place and the time of the origin of the human species bring up questions that can only at the present time be answered approximately, the data so far accumulated not being sufficient for the deduction of positive opinions.

However, man in his early unprotected condition, unable to battle with the elements, must have originated in some portion of the earth where the climate and other physical conditions were suitable for his existence. The climate was probably a tropical or sub-tropical one, such as exists in Southern Europe, Northern Africa, Southern Asia, Southern North America and Northern South America. Man must further have originated in a region where the highest of the lower animals exist, or at one time existed, as it is supposed that man descended from some of these forms. This excludes both North and South America, because these continents have never been inhabited by any animals which can be considered to be the ancestors of man; this leaves the birthplace of the human species at some point in the region of Southern Europe, Equatorial Africa or Southern Asia.

In each of these regions there exist, or at one time existed, anthropoid apes which closely resembled man. In Southern France the bones of

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the *Dryopithecus fontani* have been exhumed in the valley of the Garonne. It was in height about the size of a man, and its dentition resembled that of some primitive peoples. In Southeastern Asia and some of the Malay Islands are found many species of gibbons or long-armed apes. In West Africa, the animals bearing the closest resemblance to man are the chimpanzee and the gorilla.

"By universal consent," says A. R. Wallace, "we see in the monkey tribe a caricature of humanity. Their faces, their hands, their actions and expressions present ludicrous resemblances to our own." If the skeletons of the higher anthropoids are compared with those of man, we find all of the bones, with very few exceptions, corresponding, the differences being those of degree and not of kind. This resemblance is so pronounced that Professor Owen says: "I cannot shut my eyes to the significance of that all-pervading similitude of structure—every tooth, every bone, strictly homologous—which makes the determination of the difference between *Homo* and *Pithecus* the anatomist's difficulty.

To the anatomist or physiologist that studies but a single type of animal, no matter how competent or how thorough he may be, as to his particular specialty, the origin of animal structures may be to him incomprehensible; but to him who approaches the subject from the standpoint of comparative anatomy or physiology, guided by the compass of evolution, the explanation afforded thereby becomes clear, although the extent and character of structural development may vary greatly.

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The resemblance of man to the anthropoid apes thus being so pronounced, we must very naturally infer that both are the result of closely similar conditions, and that they both have originated probably in a geographical area in common.

It should always be remembered that the evolutionist does not consider that man was descended from any of the living species of anthropoid apes, but that they both had one common ancestor, now extinct.

While perhaps at the present time much of the evidence seems to indicate that some part of Southern Asia was the original home of man, there are a number of facts which make it not improbable that man may have inhabited as his earliest home a region which has now sunk below the level of the sea.

The theory has been advanced that, during comparatively recent geological times, a large portion of what is now the Indian Ocean was occupied by a great land mass which stretched from Asia as far east as farther India and the Sunda Islands to the southeastern shores of Africa. The island of Madagascar is considered to be a remnant of this ancient continent. The geographical distribution of animals and plants seems to indicate that this land mass may have existed. This land has been denominated "Lemuria," from the semi-apes which were probably characteristic of the region. If this land did really exist at the time that has been assigned to it, it may be possible that in this region was the cradle of the human species.

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As the exact geographical area in which man originated cannot at the present time be definitely stated, it consequently follows that the exact time of his origin is unknown. The question can, however, be considered in a general manner with evidence furnished by geology and archæology.

When the remains of man or the implements of human workmanship, such as weapons and tools, are found undisturbed in certain deposits, it is logical to infer that man existed on the earth at the time these remains or implements were deposited.

Probably the first scientist of note to insist on the great antiquity of man was Boucher de Perthes. He exhibited, in the year 1838, a series of flint implements found by him in the valley of the Somme, a river of Northern France, which empties into the English Channel. This river runs through a district composed largely of white chalk, which is, to a certain extent, covered with Tertiary deposits. These Tertiary deposits are in turn covered by gravels, and it is in these deposits that the remains of human workmanship in the form of stone implements were found, also the bones of many animals, such as the bear, hyena, elephant, etc. For years the discoveries of Boucher de Perthes were ignored, but at length, when his investigations were continued and verified by others, they were finally accepted. Among the many eminent scientific men who visited the locality was Sir Charles Lyell, in whose presence a number of flint implements were found. That these implements were of human workmanship, and that they were found in undisturbed

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deposits associated with the remains of animals long since extinct, no one competent to pass an opinion doubts, and this at once proves that the antiquity of man reaches for back into the prehistoric past, long before the pages of history were written or the tales of tradition were told.

Since these discoveries in the valley of the Somme, many other flint implements have been found in other parts of Europe, Asia and America. Not only have the remains of man and the remains of extinct animals been found together, but in a number of instances the workmanship of man is found on the bones of these extinct animals. It has been found that, in nearly all of the animals mentioned as having been contemporaneous with man, their bones have been injured. Sometimes they have been broken, evidently with the intention of obtaining the marrow from them, which was presumably used as an article of diet. Or in some instances rude drawings are found on the bones, sometimes of animals which at that time were living species, but which now are extinct.

Many of the vestiges of early man have been found in caves, which seem to have been apparently the favorite resorts of primitive man, affording him protection from the elements and from the ferocious animals which were contemporaneous with him. Many caves have been examined, and much valuable information has been gained therefrom.

The first cave to attract the attention of scientific men, and which threw much light upon the antiquity of man, was the cave of Aurignac, which was dis-

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covered in France, near the town of Aurignac, on the southern slope of the Pyrenees. M. Lartet examined this cave most carefully, and published his account of it in the year 1861. This cave evidently represented a tomb, which was in use by early man of the stone age; the entrance was closed by a slab of sandstone. Inside of the cave were found the remains of a number of skeletons of men, women and children, associated with numerous stone implements. The remains of a number of species of animals contemporaneous with man at that time were also found here, among which were the cave bear, the mammoth, the horse, the cave hyena, the rhinoceros, and several other species. Some of these animals had probably been eaten at the cave, as their bones showed the action of fire, the ashes of which were discovered. Many of the bones were scraped and furrowed, evidently by flint implements. All of the human remains were found inside of the cave, and all of the bones, both of man and of the lower animals, showed the signs of great antiquity. The age of these remains has been estimated at from 10,000 to 50,000 years.

The well-known kitchenmiddens or shell heaps of Denmark throw some interesting light on the antiquity of the human race. These kitchenmiddens are composed of large accumulations of shells and also to a lesser extent of the bones of fishes, birds and mammals. These remains could only have been accumulated by early man, and represent the animals that served him as food. The remote presence of man here is also indicated by stone implements and weapons.

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The earliest geological period at which man is supposed to have originated is during the earlier tertiary formations. Here many of the animals which were the contemporaries of primitive man have been found, and the bones of man and his implements have here also been associated. This raises the question: Are the remains of man as old as the remains of the animals? This question first gave rise to discussion in the year 1863, when M. Desnoyers reported his discovery of cut and split bones from the gravel pit of Saint Prest. Here he found the tibia of a rhinoceros, showing grooves and incisions similar to those made by man at a later period; these gravel deposits were, however, considered by some geologists to be early quarternary, rather than late tertiary, but this discovery at least takes man back to the borders of the tertiary period.

At the meeting of the International Congress of Prehistoric Anthropology and Archæology, held at Paris, in the year 1867, Professor Issel presented evidences of tertiary man of Savonia. Here, in pliocene deposits, he had found several human bones of undoubted antiquity.

In Italy many of the remains of the workmanship and also the bones of tertiary man have been found in pliocene deposits. Signor Capellini has discovered what may almost be considered positive proofs of man's existence in pliocene times in the clay deposits at Monte Aperto. In this locality he has found the ribs and shoulder-blade of the Balenotus marked by numerous deep incisions, which only

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could have been made by a sharp instrument in the hands of a man.

In Thénay flints of human workmanship have been found in the miocene (middle tertiary) deposits by Abbé Bourgeois. These flints are of various forms and sizes, and are generally admitted to have been made by man.

Many of the osseous remains of primitive man furnish characteristics which indicate that he was the inferior of the man of to-day. Of these remains it will be sufficient to call attention to only the most important.

In the small valley of Neander, a tributary to the Rhine, some workingmen, in the year 1857, opened a cave in which were found some human bones, including a portion of the skull. This skull has since become known, world-wide, as the *Neanderthal skull.* It is considered to possess many ape-like characteristics, as the prominent supra-orbital ridges, the gradual sloping of the back part of the head, and its great length in proportion to its width. The cranial capacity of this skull is 1,200 c.cm. It is perhaps the most ape-like skull of a human being that has ever been discovered.

In addition to the skull portion there were found two humeri, two femora, and some other portions of the skeleton; unfortunately the inferior maxillary was not preserved. In the vicinity where these remains were found, there were also obtained the remains of the rhinoceros, cave bear, and hyena. The Neanderthal specimens are now in the Fuhlrott collection, Elberfeld.

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In the commune of Spy, in Belgium, two interesting skulls were found in the year 1886, which have since become known as the *man* and *woman of Spy*. The remains were found associated with those of the horse, mastodon, cave hyena, and other extinct species. Flint implements were also found here. Two skeletons were unearthed; neither of them was complete, but enough of them was obtained to furnish an opinion as to their general characteristics. One of these skulls was apparently that of an old woman, and the other of a man of middle age. Both of these skulls were quite thick; the skull of the woman was long, while that of the man was slightly shorter. The supra-orbital regions were pronounced, and the foreheads were low. The jaws were heavy and the chins were very small. The teeth were large, and the third molars were as large as the others. All of these characteristics indicate an old and inferior race.

The well-known cave explorer, Dr. Edward Dupont, in the year 1866, found at Naulette, in Belgium, a portion of a very remarkable human jaw. This jaw showed an almost entire absence of the chin, and as the prominent chin is a characteristic which is confined to man, this specimen is a most significant and important one. The lower animals all possess a retreating chin, and hence the *Naulette jaw* is considered in this particular to occupy an intermediate position. The dentition of this jaw is peculiar, in certain respects resembling that of man, while in other features it resembles that of the anthropoid apes, and shows some very marked simian

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characters; the teeth were unfortunately lost, but the alveolar processes indicated that the canine teeth were very large and strong, also that the molars were large, increasing in size posteriorly. Associated with this jaw the remains of the mammoth, the rhinoceros, and the reindeer were found. The Naulette jaw is now in the Brussels Natural History Museum.

Of the later discoveries of the remains of early man, none surpass in value or interest that of Dr. Eugene Dubois, who found (1891–94) a calavarium, a third upper molar tooth and a femur, in beds of presumably pleistocene age in the island of Java. The cranial capacity of this skull has been estimated at 1,000 c.cm., which is about midway between that of the average normal of man and that of the highest anthropoid. Virchow has pointed out, however, that some of the Negritos have a cranial capacity even less than that of this specimen, and until more data is furnished regarding the Java specimen a positive conclusion cannot be formed. Dr. Dubois has called the specimen *Pithecanthropus erectus*, considering it to be not only a new species of man, but also a new genus, and also a new family, which he denominated the *Pithecanthropidæ*.

In the Thames Valley, Kent, the remains of a skeleton were found by Mr. R. Elliott and Mr. Matthew Hays in pleistocene gravels associated with many paleolithic implements and the remains of extinct mammals. The skull was exceedingly long, narrow, and much depressed with the forehead receding. The main sutures were obliterated.

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These remains are without doubt very ancient, and the most primitive that have been found in England.

At Podbada, near Prague, a portion of a skull was found in clay deposits in 1883, in the vicinity of which were also the remains of the rhinoceros, trichorhinus, and reindeer. The superciliary ridges were very prominent in this specimen, and the frontal region was quite receding. A very primitive skull was also found at Marcilly-sur-Eure, Evreux district, which was exposed by a railway cutting, and which is now in the Doré-Deleute collection, Dreux.

An inferior maxillary was found at Arcy-sur-Eure, Yonne, Grotte des Fees, which in some particulars resembles the Naulette jaw. Associated therewith were found rhinoceros teeth.

In the cave of Mentone, Liguria, human remains have been found which are of a very primitive type, and with which were associated the remains of extinct animals which were contemporaneous with early man.

At Eguisheim, near Colmar, a portion of a human skull was found in the year 1865 associated with the remains of the mastodon. The skull was quite long, with prominent superciliary ridges, and without doubt it is a very ancient specimen.

From all of this evidence we see that primitive man was a savage being, living upon the products of the chase, and dwelling in the cavities of the rocks. His struggle for existence was severe, battling on the one hand with the forces of nature and on the other with savage animals. Is it not truly

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wonderful that he should have survived? His success in this great struggle for life was not due to any physical development he alone possessed, apart from the development of his brain, because physically he was greatly inferior to many animals with which he was contemporaneous. Yet, when the struggle between man and the ferocious beasts of prehistoric times began, man came off the victor, and he doubtless was an important factor in causing the extinction of such species as were uncongenial to him. Man owes this success mainly to the superior development of his brain, and while the brain of primitive man was doubtless inferior to that of man of the present time, it was, nevertheless, sufficient to give him the great advantage as the principal actor in the drama of life.

The number of years that have elapsed since man first became man in the evolutionary progress of the history of life is a question that cannot be answered; instead of considering years, we are compelled to recognize ages, each of which, from geological evidences, has probably occupied thousands of years. From geological and archæological data, relative to this subject, the opinion held by the majority of anthropologists at the present time is that man originated from 50,000 to 100,000 years ago, and by some even a longer period of time is assigned.

As early man differed in certain respects from his descendants of the present time, so do the living members of the human species differ to a lesser extent from one another. We know that no two individuals are exactly alike in all particulars; they

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may resemble one another in the color of the skin, in the height, or in some other respects, yet close examination is sure to reveal differences, and it is the study of these differences in man which forms the basis of the science of ethnology. In considering the differences between the different members of the human family, it is advisable to consider the most pronounced characteristics presenting variations first, and afterwards give attention to those which are less marked and usually less significant.

Anatomical variations in all classifications are always considered to be of first importance, and to underlie all other variations, and in anthropology and ethnology there is no reason for departing from the zoölogical method when it can be followed.

The skeleton presents the most important variations from the anthropological standpoint. The head, the trunk and the extremities all furnish some characters which vary in the different races of man.

The skull has received the greatest attention and it furnishes the most reliable data in the comparative study of man. When we say that a certain race possesses a certain character of skull it must not be inferred that each and every member of that race has, without exception, a skull of the character designated, because such is not the case; there is ever present the tendency to variation, and our opinion is based upon the character of skull that predominates in the race under consideration; that is, our opinion is based upon that which is the rule, and not upon that which is the exception. Much confusion has arisen at times from not clearly recognizing this fact.

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The form of the cranium depends particularly on the length measured from front to back in relation to the breadth from side to side. The former constitutes the longitudinal diameter, and the latter, the transverse diameter.

Considering 100 to represent the longitudinal diameter of a skull, and 75 to represent the transverse diameter of the same skull, we would have the ratio of 75 : 100, which represents quite a long skull. The ratio of 80 : 100 would represent a medium skull. The ratio of 85 : 100 would be found in a short skull. The long skull is said to be *dolicho-cephalic;* the medium skull is *meso-cephalic;* and the short skull is *brachy-cephalic.*

Certain characters are furnished by the examination of the face, one of the most important of which is the nose. If the nasal aperture is broad, the nose is correspondingly broad and flat; while if the nasal aperture is narrow, the nose is likewise narrow. The former is known as the *leptorhinian,* and the latter is the *platyrhinian.* There may be a modification between these two, the medium, which is called the *mesorhinian.*

The orbit of the eyes furnishes a character known as the orbital index. This index is the proportion of the vertical diameter of the orbit to the transverse diameter. In the Chinese this proportion is about 93 : 100; while in the man of Cro-magnon it is about 61 : 100.

In the Black race the whole face, and especially the maxillaries, projects forward. This character constitutes *prognathism.* All individuals are to a

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certain extent prognathous; but when it is slight, as in the White race, it is designated as *orthognathism*.

The anatomist Peter Camper was induced to study the relative difference in the development of the face, by seeing the artists of his time represent negroes as whites painted black. Camper carefully studied the anatomical characters of the skull, and the result was the recognition of the facial angle which has subsequently been of such great value to craniologists.

The *facial angle* is subtended by a line extending from the auditory canal to the root of the nose, and another line extending from the most prominent point of the foreherd to the nasal bone. This angle varies from about 70° to 80° in the different races of man.

Another important angle is the *maxillary angle*, which is formed by a line from the most prominent point on the forehead to the most prominent point on the maxillaries, and another line from the most prominent point of the maxillaries to the most prominent point of the chin; these lines intersect and the angle formed varies in size from 140° to 160°.

The teeth are in many instances of value in the comparative study of man. In the savage races they are usually larger and stronger than they are in civilized man. Among some tribes the canine teeth are larger than among others. The third molar or "wisdom teeth" are usually furnished with three separate fangs, or roots, among the dark-

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skinned races, while in the White race these teeth possess only two separate roots and are usually much smaller in size.

In the trunk, the most important racial characteristic is found in the bones of the pelvis. The iliac bones in the Black races are more vertical in position than they are in the White race. Weber considered that the shape of the inlet was a feature of racial importance; in the White race he considered it to be nearly oval; in the Yellow race, quadrilateral; in the Red race, round, and in the Black race, cuneiform.

In the negro the arm is proportionally much longer than in the White. This character is quite constant and is due to the length of the bones of the forearm, the radius and ulna being longer than they are in the White race.

At the lower end of the humerus is sometimes found the inter-condyloid foramen; it is more frequently observed in the lower races of man and in the bones of ancient man than it is in the living members of the higher races.

Leaving the skeleton, we find that the remaining ethnic characters of especial importance are found in the hair and in the skin. A cross-section of the hair in the members of the different races presents several different outlines; the diameter of the cross-section varies from about 25 : 100 to about 90 : 100, the more circular the section, the straighter the hair; while the flatter the outline, the more curly or wooly the hair. In the Chinese the hair shows on cross-section an almost perfect circle and the

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hair is straight. In the negroes the cross-section departs greatly from the circular outline, and the hair is woolly. In the White race the hair is considered to be wavy, and a cross-section reveals an outline between that of the Mongolian and the African.

The color of the skin is recognized by all as being a valuable character in the study of mankind, and from this standpoint all of the races of man can be divided into four different groups, or races, as follows: The *Black* or *Negro* of Africa; the *Yellow* or *Mongolian* of Asia; the *Red* or *Indian* of North, Central and South America; and the *White*, commonly known as the *Caucasian*, of Europe.

In the large majority of cases the color serves as a valuable index to racial criteria; but, at the same time, as all tend to merge by almost imperceptible degrees into each other, it cannot be considered to be an infallible guide. Anthropologists that accept this classification based on color, use it not because it is an ideal one, for such is not the case, but simply because it is considered to be one of the best and most convenient available. Some investigators have, and with good reason, rejected giving to the American Indian the status of a race, contending that the differentiation is not sufficient to separate them from the Yellow or Mongolian race.

In dividing mankind into these several groups, we, of course, recognize that all of them differ more or less from each other, *i. e.*, they are not all equal, and, not being equal, it necessarily follows that some are superior, while others are inferior. The

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race presenting the most marked characters resembling primitive man, anatomical or otherwise, is the lowest; and the race which has those characters most highly differentiated is the highest. Measured by these criteria, the White race is the highest and the Black race is the lowest.

When we recognize the existence of the several different races of man, the question naturally arises as to whether these races are the descendants of one original race of man, or the descendants of several different primitive stocks. This question, especially in times gone by, has caused much difference of opinion among anthropologists. The *Polygenists*, on the one side, consider that the differences between the different races are the result of different origins; and the *Monogenists*, on the other, believe that the living races of man are derived from one common primitive stock and that such differences as they present are merely the result of environment and other factors, such as those under which all organic forms live. The tendency of opinion of scientific men of the present time is to believe in the single origin of the human species.

This question has at times had an important bearing on political matters when racial questions have been considered. Such was the case in the United States in the year 1844 during the administration of President Tyler. The Hon. John C. Calhoun was at the time Secretary of State, and was conducting diplomatic negotiations relative to the annexation of Texas. In quite a long controversy England continued to interfere with the institution

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of negro slavery; and Mr. Calhoun, desiring to present as strong a case as possible for the custom of slavery, consulted two of the most prominent American anthropologists of that time. These were Mr. George R. Gliddon and Dr. Samuel George Morton, and with the aid of special volumes on the subject, furnished by the latter gentleman, he found that the races in the past had existed approximately in their present relationship to each other as far back as they could be traced, which was a period of at least 4,000 years, whether an original diversity of origins be admitted or not. Although there was objection by some to the introducing of scientific questions of a rather technical nature into diplomatic correspondence, Great Britain finally assured our government that it had no intention of meddling in our domestic affairs.

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CHAPTER II.

THE BLACK (AFRICAN) RACE.

CONTENTS.—The characteristics of the race. Color of the skin. The hair. The skull. The jaws. The cheek bones. The nasal index. Stature. The branches of the race. The Negrillos. The Pigmies, their distribution and characteristics. The Akkas, the Wochua, the Andamanese, and the Batwa. The Hottentots, their distribution and characteristics. The Bushmen, their distribution and characteristics. The true Negroes. The Soudanese and their distribution. The Wolofs, the Serers, the Baniuns, the Mandingoes, and others. The Bantuas, their characteristics and distribution. The Zulus and the Kaffirs. The ability of the Negro. Slavery. Status of the race in America.

THE Black race has from the earliest times inhabited the continent of Africa. The members of this race are in general identified by the color of their skin, which is usually of a black, or blackish tint, sometimes even being almost sooty black; it is velvety and cool to the touch and emits a distinct and very characteristic odor.

The physiognomy of the Black is so decidedly characteristic that it is impossible not to recognize it even if the individual were not identified by the color of the skin.

The hair is jet black, and frizzly, or "woolly;" and on transverse section it exhibits an almost flat outline.

The skull is usually dolichocephalic; the jaws are prognathous; the cheek bones are high; the

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nose is broad and flat, and the lips are, as a rule, thick and to an extent everted.

In stature the members of this race are generally somewhat above the average height, although there are a number of negro tribes below the average; they have a large bony frame, stout and robust, but proportionally weak in the lower extremities.

The Black race may be divided into the following three different groups: The *Negrillos*, the *Negroes* and the *Negroids*. These groups in a general manner all possess the salient characteristics which distinguish the race, but in many of the minor characteristics they present considerable variation. Between these groups all degrees of intermediate variation can be recognized.

The word Negrillo is derived from the Spanish and is the diminutive form of the word negro. The most important members of the negrillo branch are the *Pigmies*, the *Hottentots* and the *Bushmen*.

The Pigmies inhabit that portion of the African continent from about two or three degrees north of the equator southward into the region of the Congo River.

Certain of the ancient writers, as Aristotle, Herodotus and Homer, made reference to dwarf tribes, but their accounts were considered mythical until recent times, when these little people were re-discovered by later explorers. The Pigmies were re-discovered by Schweinfurth, who found the *Akkas* inhabiting the region about 3° north latitude and 25° east longitude. He was able to obtain one of these Akkas in exchange for one of his dogs, in-

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tending to take him back to Europe, but at Berber, south of Khartoum, he died. Later travellers, as DuChaillu, Stanley, Emil Bey, and others, have seen and given descriptions of these people. The traveller Miani later obtained two young Akkas that were taken to Europe and which have since been most thoroughly studied by different anthropologists.

The Pigmies vary in height from about 3 feet 4 inches to slightly less than 5 feet. Except for the prominence of the abdominal region, they are well proportioned, remarkably agile, quite intelligent, and are daring and expert hunters. They are adepts in the use of the bow and arrow and the spear, and do not hesitate to attack the largest game, such as the buffalo and the elephant. It seems probable that at one time the Pigmies were much more numerous than they are at the present day, and that their populations were more continuous. The other African tribes have encroached upon them and their final extinction seems almost inevitable.

"They are in no sense a degraded race, fallen from a higher state," says Keane, "but obviously a small people, arrested in their development, probably by an adverse environment."

According to De Quatrefages, the Pigmies are brachycephalic or sub-brachycephalic, while the Bushmen are dolichocephalic or sub-dolichocephalic, this being an anatomical character of considerable interest and importance. The various tribes of pigmy people, besides the Akkas, are the *Wochua*, the *Andamanese*, the *Batwa*, and others. The nomenclature regarding them is by no means uniform.

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South Africa is inhabited largely by the Hottentots and Bushmen. These two peoples to an extent have certain resemblances in common, but at the same time present such physical differences and also pursue such different modes of life that it becomes probable that the relationship existing between them is not as close as many anthropologists have previously supposed.

Many anthropologists consider that the smaller African peoples, *i. e.*, the Pigmies, the Hottentots and the Bushmen, are probably the lineal descendants of the original inhabitants of the continent.

It is considered by many that the Bushmen and Hottentots possibly occupied at one time during the remote past history of the human species the greater portion of South Africa from the Soudan to the Cape of Good Hope, and that they have gradually diminished in numbers and influence owing to the oppression of other African peoples from the north and later the Europeans in the south. This perhaps may have been the case, but the evidence of its truth is decidedly meagre.

The word Hottentot signifies a stammerer, and was applied to these people in ridicule of the clicking sounds of their words by the Dutch who founded Cape Colony in 1652. They call themselves Khoü-Khoï, which signifies "the men." They are still numerous in Cape Colony, constituting nearly one-seventh of the entire population.

In height they average about 5 feet 4 or 5 inches; their hands and feet are small; the muscular development is poor; the skull is dolichocephalic;

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the face is prognathic; the mouth is large, with thick protruding lips. An important characteristic found in the Hottentot women is the elongation of the labia minora, making the so-called "Hottentot's apron."

The Hottentots were said to be cattle breeders when they were first known to the Portuguese; they also depended largely upon wild plants and roots, but gave little, if any, attention to agriculture. Their houses were built of sticks stuck into the ground, and then lashed together at the top and covered. Their clothing consisted of aprons and cloaks, and from motives of modesty the women wore fur caps. They made an intoxicating beverage from honey, and now drinking is quite a prevalent custom among them. Their weapons of warfare comprized spears, darts and shields for defense. They were conversant with the art of smelting iron ore and manipulating the metal. They were accustomed to the use of oxen as beasts of burden from very early times. For purposes of cooking earthen vessels were used.

It was formerly considered that they were entirely destitute of any religious sentiment, but such now hardly seems to be correct. They attribute supernatural powers to their ancestors, and invoke them on all serious matters. They bury their dead with great solemnity, and over the grave place heaps of stones, or cairns. Owing to these cairns the study of the distribution of these people has been greatly facilitated. Their religious deity is Tsunigoam; they believe in a future life, perform certain religious

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ceremonies and say prayers. Some of them without doubt worshipped the moon which they regarded as being of the masculine gender. There were among them Shamans who were supposed to be able to exercise power over the elements and to be able to produce rain, or sunshine or cast out the spirits of disease at will.

Beyond the British possessions and the Dutch republics each tribe has its own chief, but as their political organization is very loose, he possesses but little influence.

With the progress of civilization the Hottentot tribes seem doomed to extinction. "What has become of the Koranas, who had their camping grounds on the shores of the Table Bay when the first European colonists settled in the country, and of the Gri-Kwas (Griquas), who encamped farther north near St. Helena Bay?" says Reclus. "Many other tribal groups, such as the Gauri, San, Atta, Haïssé, Sussi, Dama, Dûn, and Shirigri, have also disappeared, leaving no memory behind them except the names given by them to their rivers and mountains."

Many of the Hottentot tribes still resisting English civilization have withdrawn northward; and it seems that the most undesirable of them have remained. The Hottentot of the present time at Cape Colony, on the whole, seems to have the reputation of possessing more vices and fewer virtues than any people known. He hates work of any kind. He loves rum and tobacco, and frequently indulges in the smoking of dacha, or hemp. Added to all of these is his extreme filthiness.

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Dwelling in the region of the great Kalibari Desert are the Bushmen. In some particulars they resemble the Hottentots very closely. In stature the Bushmen average about 4 feet 8 inches. They are hunters and depend largely on the bow and arrow, sometimes making use of the poisoned arrow. They make their clothing out of the skins of wild animals. Their dwelling-places are in caves, or in rudely constructed abodes made by bending the foliage of the bushes into a sort of nest, for which reason they have received the appellation of Bushmen. According to Reclus, however, in the territory occupied by these people numerous woody plants from 4 to 8 feet in height abound, having a dull green or bluish foliage. This is the so-called bush country of the English and the inhabitants have hence been designated as Bushmen. They call themselves Khui. By the Hottentots they are called Sân.

The earliest account of the Bushmen was given by Simon van der Stell, the Dutch governor of the Colony, in the year 1685. In his narrative he gives a description of a people that would apparently apply to the Bushmen of the present time. "They carried," says that writer, according to Prichard, "bows and arrows and assagays, possessed no cattle, and subsisted on wild honey and the game which they shot. Their abodes, or rather places of wandering, were along a stream which flowed from the Gricqua Mountains, falling into the Olifant River."

The Bushmen have a yellowish complexion, which has in some instances been compared to that of the

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Mongolian. They also resemble them in certain other respects, such as the small black eyes, the broad and prominent cheek bones, the contour of the mouth and chin, and the regular and white teeth. They differ from the Mongolian in having a dolichocephalic skull, and a forehead which bulges out, instead of the brachycephalic skull and receding forehead of the Asiatics. While the cranial capacity is below the average, the general development does not indicate any lack of intelligence.

One of the curious physical characteristics of the Bushmen is the great number of wrinkles covering the whole body, the skin apparently being too large for the frame; this condition is corrected, however, under a more liberal diet. Like the Hottentot, the beard is scanty, and the body is almost entirely hairless.

The Bushmen represent a people that are degenerating. They seem to have no social organization. They wander around in small bands without any regular chief, and family ties are very loose. In some respects, however, the Bushmen are superior to the neighboring tribes, as their rock drawings show a considerable degree of intelligence, and their folklore is quite extensive. They have been greatly persecuted by the other native tribes, as well as by the Dutch Boers, who have gone so far as to deny that they possessed articulate speech, and under such environment it is probable that they will not be able to survive long.

The ethnic relationship existing between the Hottentots and the Bushmen is not clearly under-

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stood; there certainly seems to be, however, some relationship between them, but probably not a very close one.

The true negroes form a majority of the population of Africa, but in reality occupy less than half of the land. Their habitat being from the Sahara southward to the region inhabited by the Hottentots and the Bushmen, and from the Atlantic to the Indian Ocean. Adjoining regions are occupied by tribes presenting distinct variations from the true negro type.

Of the various classifications of the negro peoples none have been generally accepted by ethnologists. Conflicting and inaccurate names of tribes have been given by various travelers, so that at present anything like a systematic arrangement is almost impossible.

By some physiologists it is alleged that the blood of the negro is thicker and has fewer red corpuscles than are found in the blood of the members of the white race. The temperament is not so sensitive as that of the white race. They do not suffer from surgical operations to the extent that Europeans do. The negroes seem to possess some immunity to typhoid and other fevers, cancer, croup and dental caries. They are especially susceptible to disease of the pulmonary system and, also, to bilious and cutaneous diseases.

It was a mistake of the earlier ethnologists to associate with the negro everything that was brutal and beastlike. His capacity for improvement was doubted, and even his position as man was sometimes questioned.

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From a linguistic standpoint the negroes are divided into two groups, the *Soudanese* and the *Bantuas.*

The Soudanese, as the name signifies, inhabit the region known as the Soudan, which stretches south from the Sahara, from the Atlantic Ocean to the Red Sea. From the earliest times this region has been recognized as the real home of the true negroes. In this territory there have been found many individuals and even tribes that are said to be almost black in color. From this hue all gradations in the complexion of the skin occur, some of the lighter shades being of a mulatto color.

The nations of this region are divided into many different tribes, and are known by various names, They have been grouped mainly by the languages spoken.

Between the Gambia and the Senegal Rivers dwell the *Wolofs*, one of the finest tribes of the negro race. The significance of the name Wolof has occasioned some discussion, which is quite interesting, as there is some difference of opinion as to whether it means "Talkers" or "Blacks." In color they are certainly very dark, and have been referred to as the "blackest of the black." In the Cape Verde region are the *Serers.* In the coast region are also found the *Baniuns.* The *Mandingoes*, which are an important negro nation, inhabit the region from Upper Guinea on the south to Timbuctoo; this is the most important nation of the Western Soudan, and has many branches. It is extremely difficult to decide just what tribes should be considered as be-

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longing to this group, as the alleged members present all variations from the true negro to the negroid. The *Kassouke*, *Jallouke*, *Soninke*, *Vei*, *Bambara* and others are generally considered to belong to them.

Along the course of the Niger River dwell many petty kingdoms, and also some of considerable magnitude. Sansandig is said by Brinton to have a population of 30,000 inhabitants, and Timbuctoo, 20,000. These natives are mostly hunters and warriors, but give, however, considerable attention to agriculture, and through intercourse with the Arabs, carry on considerable commerce. They have largely accepted the Mohammedan religion.

The natives of Guinea are mostly savages; they have greatly deteriorated, and all attempts to civilize them up to the present time seem to have failed. This is well illustrated by the history of the people of the Republic of Liberia, who have not only failed to make any impression towards civilizing the aboriginal inhabitants, but who themselves are rapidly, from all accounts, relapsing into barbarism.

The many natives of this region are comprised in many small groups, each with its own distinctive name, which, as a rule, has no ethnic value, and which is subject to variation, owing to admixture with other groups of peoples.

In pre-Mohammedan times many of these natives were devil worshipers, and where these views still prevail the natives assemble at some spot held in special veneration and make an animal sacrifice to appease the evil spirit.

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Along the Beneri River dwell the *Bolo*, *Yaco* and *Mistri* tribes. Living along the Shari River are the *Bashirmi*. In the region of Lake Tchad are many different tribes, among which are the *Mongu*, the *Yedina* and the *Kuri*. Near Kordofan are the *Nubas;* dwelling on both sides of the Nile, between the first and second cataracts, are the *Barabras*. Along the Welle are the *Mombuttu* and the *Zandah*, both of which are cannibals.

Between the Niger and the Bornon rivers the Hausa language is spoken which in its words expressing number shows some relationship to the ancient Egyptian.

There are many other tribes of more or less importance scattered at various points throughout the Soudan, but it seems hardly advisable to mention more of them here. Whenever we approach the border line of the Soudan in any direction, influences from the other races become clearly recognized in the physical characters of the negro, plainly showing that the contact with other peoples has resulted in modifying the coal-black color of the skin to a perceptibly lighter hue.

The Bantu peoples, while mainly negro in character, present certain characteristics which make them differ from the true negro type, and are hence referred to as negroids.

These Bantu negroids are usually of a lighter color than the negro, although all intermediate hues are found among them; they have a larger cranial capacity and are not so prognathic. They are more intelligent than the pure negro, and are more civi-

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ilized. The Bantu negroids are a mixed people, the ethnic elements entering into their composition being, on the one hand, largely negro, and, on the other, to a lesser extent, Semitic and Hamitic influences.

They inhabit many portions of Africa south of the equator, extending to the territory occupied by the Hottentots and the Bushmen.

One of the most important divisions of the Bantu group are the *Zulus*, which name is now generally applied to an aggregation of tribes or clans all conspicuous for their physical and intellectual development. The Zulu men are brave warriors, and enjoy field sports. Polygamy has been practised by them from time immemorial, and the marriage with the twentieth wife is considered as binding as where monogamy prevails. As a people, the Zulus thus far seem to have avoided the evils of drunkenness and crime, and their morality is considered exceptional. They pursue mainly a pastoral life, and their art is limited to the making of iron implements, pottery and various ornaments of copper, ivory, horn and wood. In the region of the Cameroons are the *Bayon*, the *Basa*, the *Abo* and the *Barombi* peoples.

Separated from the Zulus by the Drakensberg Mountains are the *Bechuana*, who are probably related to the Hottentots; they are divided into the Eastern Bechuana and the Western Bechuana. North of these people, in the upper basin of the Zambesi River, dwell the *Barotse*, a people who are considered to be related to the Zulus.

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In the southeastern region are *Kaffirs;* they are a people of magnificent physical development and are to an extent agricultural in their habits, although in the main they are warlike and many of them are said to be cannibals. They do not form a united group of people, but are split up into a number of tribes, and the color of their skin varies from a light brown to black. The Kaffirs practice polygamy, but the wives are of unequal rank. They are a superstitious people and make sacrifices to appease evil spirits on every hand. They consider that snakes represent ancestral forms and consequently treat them with considerable respect. They believe most sincerely in witchcraft, and the witch-doctor of the tribe is a man of great importance.

They also possess large herds of cattle, which comprise their main wealth, and which constitute what might be termed their currency. Even their wives are said to be measured by this medium of exchange, an "average" wife being said to be worth eight cows.

The Congo region is occupied largely by these Bantu tribes, which linguistically are related, but in physical characteristics present considerable variation and differ from the Negroes proper in the color, features, shape of the skull, and in the general development of their physique, although all intermediate gradations may at times be observed. From forty to fifty distinct idioms of Bantu speech in this region have been recognized, but as yet sufficient material has not been collected to afford

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anything like a satisfactory classification of the Bantu peoples of this region; the *Nyamezi* dwell to the east and the *Rua* to the west of Tanganyika. The *Reggas* occupy portions of the country between the Congo and Lake Mutes Nzige, and the *Ba-Lolo* are found along the banks of the Congo where it makes its great curve. Other peoples inhabiting this region are the *Ba-Ngala*, the *Bu-Banghi*, the *Wa-Buma*, and the *Ba-Frot* more generally known as the *Congolese*.

The territory of the Zambesi, and the region of Lakes Tanganyika and Victoria Nyanza is also largely populated by Bantu tribes.

The languages spoken by these Bantu negroids have a large number of roots in common, which are modified into words by peculiar defining prefixes.

Owing largely to the savage wars that the African populations have been continually waging since the country was first known to Europeans, the ethnic relationships of the different peoples have been greatly obscured, and attempts at accurate classification seem wellnigh hopeless of yielding satisfactory results. Constant intermingling of the different tribes has occurred, and the ethnologist is compelled of necessity to depend upon linguistic classifications in his attempts to obtain order out of this chaotic condition.

Among both the Negro and the Bantu peoples the village is the political unit; it is generally governed by a chief, who is advised by a council of the older or most able men of the village. Ruling over several of these villages is another chief or king,

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who stands much higher in authority. The king generally dwells in the largest of the villages that come under his jurisdiction. In the centre of each village there is usually a council house, where the people of the village congregate on various occasions. Each master of a household usually has as many houses or huts as he possesses wives.

The true negro is of a cheerful disposition, and so long as his immediate necessities are provided for is not easily depressed. Negro children are frequently quite bright and intelligent, and until the age of twelve or fourteen years is reached, learn quite readily; but at this time a change usually occurs, progress apparently ceases, the intellect seems to become cloudy and the characteristic indolent nature of the negro manifests itself. This may perhaps be explained by the fact that the cranial sutures in the negro skull close, and consequently retard brain development, at an earlier period than in the White race. So long as the negro is aided and encouraged by the white man, he seems to succeed, but when he loses this assistance he gradually relapses towards his primitive condition, as he has done in Liberia and Hayti.

Without the aid of other races no negro people have ever reduced their language to a written form.

Architecture was not in the slightest manner developed by any pure negro people; and they did not, except when brought under other influences, build even walls of stone. In the working of iron and copper they have shown some ability, as the art of smelting iron ore and making it into imple-

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ments and weapons is quite generally understood by the native tribes of the African continent. In all portions of this country travellers have found the natives in the so-called iron age. By means of their rudely constructed bellows they are said to be able to raise quite an intense heat, and the metal smelted is sometimes of quite a fine quality, so that many of the natives prefer their own iron utensils rather than those of foreign make.

Some ethnologists have gone so far as to consider that the knowledge of iron-working was introduced into Europe from Africa owing to the ability of the natives in this particular. There is, however, no evidence to offer in support of this contention, and therefore it cannot be considered true.

In the arts of weaving, pottery-making and agriculture they possess considerable knowledge and skill.

From early times negro slavery has existed; the Carthaginians probably brought slaves from North Africa, and for a long time slave trade has been carried on by the Arabs.

The discovery of America gave impetus to slavery, and nearly all European countries afforded to it legal recognition. Between the years 1680 and 1700, England exported at least 300,000 slaves from Africa, and between the years 1700 and 1786, imported into Jamaica over 600,000 slaves. In the year 1808, slave trade was declared illegal by Great Britain, and other nations gradually followed the same course. France emancipated its negroes in the year 1848. In Brazil, slavery existed until the year 1888.

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In the year 1860, according the census, there were in the United States 3,953,760 slaves, and it was not until after a most cruel war that slavery ceased to exist here.

As a result of this pernicious system of human slavery, we now have in the United States about 9,000,000 negroes; they are no longer slaves, but are now given the same legal status as the whites. The equality of the two races has been established on paper, but to the anthropologist it is only on paper that this equality exists. Measured by all anthropological criteria, the black is greatly the inferior of the white, and, according to the principle of the survival of the fittest, the negro must inevitably succumb in the struggle for existence if he is compelled to endeavor to maintain a position equal with that of the whites in a civilization for which he is not prepared.

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CHAPTER III.

THE YELLOW (ASIAN) RACE.

CONTENTS.—The physical characteristics of the race. The original home of the race and its distribution. The Sinitic and Sibiric branches. The Chinese, their culture, their language and their religion. The Thibetans. The Indo-Chinese or the Thibeto-Indo-Chinese. The Tunguses. The Kalmucks. The Tartars. The Turks. The Finns. The Lapps, or Laplanders. The Chukchis. The Namollos. The Kamschatkans. The Giliaks. The Aleutians. The Ainos. The Japanese, their physical characteristics, their origin and their culture.

THE characteristic presented by the Yellow or Mongolian race, in which it differs mainly from the other races of mankind, is the color of the skin, which is of a yellowish tint, blending at times to an olive shade; the hair is usually black, coarse and of a dull lustre, and in outline on transverse section, is circular; the beard is scanty or absent, the mustache being usually proportionally more developed. The skull generally exhibits the meso- or brachycephalic type; the cheek bones are prominent; the eyes are of the so-called oblique variety; the nose is small and concave; and, on the whole, the features presented by the face may be described as being broad. These characteristics are also presented in the main by the Red race, which tends to make the argument in favor of the Mongolian origin of the American aborigines very strong. Asia is considered by nearly all ethnologists to be the original home of the Yellow race.

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The Yellow race, from their original home, at times considerably extended their geographical distribution. Evidence of their presence in Mesopotamia has been found, and, while they penetrated into Europe, they did not, so far as is known, ever reach Africa. Portions of the race helped to furnish the populations of Japan, Malaysia, Australasia and Polynesia. That they reached the continent of America probably by way of Behring Strait cannot well be doubted, as travel to and fro by the inhabitants of the two continents at this point has occurred as long as we have had any knowledge of these regions.

The Yellow race may be divided into two branches, conforming in a general manner to their geographical distribution. The first of these has been designated by Brinton to be the *Sinitic*, which includes the people of China and Farther India; and the other the *Sibiric*, the geographical distribution of which is embraced in the region north of the Altai Mountains and the Caspian and Black Seas, and extending from the Pacific to the Atlantic Ocean.

The first group included in the Sinitic branch are the *Chinese*, which, while a mixed people, constitute one of the most definite varieties of mankind. In the various provinces, from Canton to the Great Wall, a large number of types are found which present, in some instances, marked contrasts to each other. The general characteristic which runs through all is their common culture rather than any particular racial character.

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In the evolution of society the people of China have passed through essentially the same phases of development as the people of Europe. China has had its paleolithic and neolithic stone ages. The western archæologists consider that weapons were first made of wood, next of stone, and finally of metal. While the Chinese have thus passed through many of the successive stages of development that the White race has, this development is usually arrested and falls far short of the perfection that is accomplished by the White race.

The culture of the Chinese, while old, is without doubt not as ancient as it has been reputed to be, although some four thousand years ago while the Europeans were still barbarians China had its literature and written history. The records preserved by the Chinese in their annals constitute one of the most important and complete histories ever made by any people; they treat largely of political events and record observations relating to natural phenomena. They were familiar with the power of the magnet to point to the north as early as 121 A. D., but utilized this knowledge by applying it to toys instead of to navigation. They probably invented movable type as early as the eleventh century, but never utilized this knowledge, so far as is known, for the purpose of printing. They made gunpowder long before the Europeans, but used it mainly for the manufacture of fire-crackers. From remote periods in their history they have domesticated cattle, but, it is maintained, do not milk their cows. The Chinese people always seem to have just fallen short of accomplish-

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ing great ends. Had they utilized the powers they possessed in the compass and in gunpowder their present status among the nations of the world would probably have been different from what it is to-day. They have originality, but the capacity for development seems to be lacking, and, for this reason, their ability to succeed has been correspondingly diminished. This is considered by anthropologists to be due probably to arrested development. The Chinaman may be said to be pre-eminently practical, devoid almost entirely of theory; and without theory progress is wellnigh impossible.

The Chinese still retain a primitive form of speech. Their dialects comprise a small number of monosyllabic roots. From these roots thousands of meanings are evolved by the different tones in which the root words are pronounced. The natives of the different provinces are unable to communicate orally together, but by their ideographic system of writing they are able to understand one another. This system of writing is also understood in Korea, Japan, Annam and Siam.

The religion of the Chinese consisted originally in the worship of the objects and forces of nature. All natural phenomena were supposed to be the result of the labors of good or evil spirits, and to these they offered up prayer and sacrifice. Their supreme diety was Tien, or Heaven; Ti, or Earth, constituted another deity, and from the union of these two all nature resulted. The dominating religions of China at the present time are those of the Buddhists, Taoists and the followers of Confucius.

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They give very little attention to the tenets of these different religious systems, the same individual frequently accepting all, as does the Emperor.

The great philosopher, Confucius, who lived from 551 B. C. to 479 B. C., has always been appreciated by the better classes in China. Confucianism has frequently been called a system of morality without religion. He devoted his teaching to the practical side of life and excluded almost altogether the supernatural element; his position on many questions was that of the agnostic. "How," he asks, "should I pretend to know anything about heaven since it is so difficult to clearly understand what takes place on earth? You have not yet learned to live and you already rave about what may happen to you after death," said he. He dwelt on the duties of man to man, to his superiors, and to the State. The influences wielded by the teachings of Confucius in China have been very great; he has there been recognized as the "teacher of the nation."

Buddhism was introduced into China about 200 B. C., and about 300 years later it received the official recognition of the Emperor. It has nominally since become the national religion, and is accepted in a general way by the majority of the population. The real significance of this system is, however, but poorly understood by the Chinese.

The Mohammedans have considerable influence in China, it having been estimated, according to Reclus, that at present there are at least 20,000,000 of that faith.

The Chinese people may be said to be, as a rule,

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good-natured, reserved and courteous, and in certain respects seem to possess some very commendable qualities. It is said that drunkards are but rarely seen on their streets, and exhibitions of violence are exceptional. In the school-room the children show great obedience to their teacher and apply themselves industriously to their studies. They are, to an extent, bright and cheerful, but, nevertheless, possess a seriousness beyond their years. They exhibit an aspect of dignity which is preserved throughout life. This is also a characteristic feature of the American Indian. The family group constitutes the most important feature of Chinese society. At one time the whole nation was known as the "hundred families." Their moral system is based mainly on the respect of the children to their parents, especially the father. The merits of the individual occupy a secondary position to the merits of the family, and, as a rule, it is the family alone that exerts any political power. It is, however, the father that expresses the sentiments of the family; whatever his opinion is, is expected to be accepted by his family as final and correct. He receives honor and credit for the virtues of the family, but is also held responsible for its faults. The heroic acts of the children ennoble the family and the entire line of ancestry; and, on the other hand, any crimes committed bring disgrace upon the entire family and their whole ancestral line.

Their funeral ceremonies are quite elaborate, and the family, especially the children, are expected to give public exhibition of their grief. Incense is

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burnt in memory of the dead, and he is supplied with fictitious paper money and also clothes, horses and servants, also made of paper, and whatever else is supposed to be required by the departed in the other world. During the period of mourning, which lasts for three years, the mourners do not attend public gatherings, and are said to abstain from meat and wine. When possible, the dead are finally deposited in the places of their nativity. In the month of May of each year the graves are visited and offerings of various kinds, as fruits and flowers, are made. In these ceremonies age is always given precedence over rank. When children, bachelors and women die, the ceremonies are much less elaborate. The bodies of infants among the poorer classes are frequently left along the banks of streams. Infanticide, especially of female children, is, to some extent, practiced among the poor.

The women occupy a very inferior position in Chinese society, and among them artificial deformity of the feet is practiced. At the age of about five or six years the feet are bound up in such a manner that growth is materially interfered with and considerable deformity is the result, which impairs the individual for life. This deformity is considered in Chinese society to be a special mark of distinction.

The wife is practically the slave of her husband, and absolute submission to his will is required. The husband may select his concubines and the wife is compelled to receive them. The right of divorce is limited to the husband, who may dismiss his wife at will, or if he so desires may sell her.

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Marriage is performed with various and elaborate ceremonies.

Numerous brotherhoods, or secret societies, exist among the Chinese, and exercise great influence; and from them the various insurrections usually originate. One of the most important of these societies is that of the Taïpings, which waged such a formidable rebellion from the years 1851 to 1865, and which, had it been successful, would have occupied an important position in the history of China.

The natives of the great Thibetan plateau and the adjoining regions are known as the *Thibetans*, and constitute the next group of the Sinitic branch of the Yellow race.

The greater portion of Thibet still remains unexplored. The Thibetans possess the characteristic Mongolic physical type. They are well spoken of by travellers, who consider them a quiet, frank and dignified people. They are physically well developed and are brave; they are fond of music and dancing, but lack energy and enterprise. The Thibetans have for a long time been in their present state of civilization. In some localities many of the natives are able to read and write, and books are said to be found in many of their homes. Their language in evolutionary development is considered to have passed that of the Chinese; their dialects are numerous, and greatly differ from each other in different portions of the country.

The religion of the Thibetans is Buddhism, which was early introduced among them. Many monasteries and convents have been built in various por-

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tions of the country, and numerous priests find employment; it has been estimated that there is one monk to every family.

These people are pastoral, and to a lesser extent agricultural; milk, butter and barley meal constitute the most important articles of food among them.

Polygamy and polyandry are practiced in Thibet, and yet from the testimony of travelers it seems that matrimonial difficulties are not more numerous here than in other countries. In Farther India and Cochin-China the natives present certain characteristics, as wavy hair, which seem to indicate a mixed descent, and which have been termed the *Indo-Chinese* or the *Thibeto-Indo-Chinese* subdivision. This constitutes the last group of the Sinitic branch. The natives of Burma, Siam, Annam and Cochin-China are here included.

The first group of the Sibiric branch are the *Tunguses*, that inhabit portions of Siberia, from the Sea of Okhotsk to Jenissia and to the Arctic Ocean. It has been estimated that 60,000 to 70,000 of them inhabit Siberia. Some of them have adopted Russian ways; but most of them are hunters, wandering through the forests, sometimes without tents, and obtaining shelter in natural caves and in the trunks of trees. They are good woodsmen and their keenness in the forest is excelled by probably only the North American Indians; various signs and marks totally unintelligible to others are used effectually as methods of communication among them. These people have many curious traits, as for example,

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when a woman is confined in labor she immediately seeks seclusion in the forest, and alone and unaided she there gives birth to her child even though she die. The new-born infant is given the name of the first stranger that crosses a burning brand at the threshold. The dead are not buried, but with the head pointing west are placed in the branches of trees. They make important use of the reindeer, using its flesh for food, the skin for clothing, and the bones for various implements. The Tunguses make their tents, cradles and baskets from the bark of the birch tree, and travellers describe them as possessing marked hospitality.

The *Kalmucks* or Western Mongols inhabit the region of Zungaria, around Koko-nor in Northeast Thibet; in the Ordus region of the Yellow River of China; and in the steppes between the Don and the Volga and the Caspian. They are nomads, and depend mainly on the raising of large herds of cattle. Their language is more phonetic than that of the Eastern Mongolian. These wandering people are good horsemen, and some of them breed and break in camels; they are a tricky people and resort to fraud and theft where it serves their purposes to do so.

Their villages are found on the lonely steppes and their habitations are made of tents which have been described by M. Vereschagnine as containing, in much confusion, boxes, lassoes, saddles and other odds and ends. A rudely constructed hearth serves as a place for them to build their fire. In the summer their clothing is meagre, and during their cold

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and bleak winters they remain as much as possible huddled together in their tents.

The *Tartars* comprise certain tribes of mixed origin inhabiting Tartary, Siberia and the Russian Steppes. The word Tartar has no fixed ethnological significance.

The modern anthropologists consider that the *Turks* were originally members of the Yellow race, although the modern Turk, through constant interminglings with the Semitic peoples, possesses at the present time many of the characteristics of the White race. The Turks are, in general, a tall, robust set of men, with a tawny or swarthy complexion, with a rough but frequently handsome physiognomy. They include a large number of ethnic groups some of which present marked differences as to life and language.

The most important group of people belonging to the Turks are the *Osmanles* whose descendants are at the present time the rulers of European and Asiatic Turkey. The tendency to nomadic life is still strong among these people. Their present physical characteristics present many affinities to those of the White race, but modern anthropologists are quite agreed that originally they came from the Yellow race.

The *Yakuts* occupy an extensive area radiating from Yakatak, which to the south is covered with lofty mountains, and to the west and north extends a plain interspersed with thick and bushy trees. The region is well supplied with numerous streams which are navigated by the natives in bark canoes

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and boats capable of holding two or three persons. For traveling over the land the reindeer is used. The Yakuts have been estimated numerically to comprise about two hundred thousand. They are a stout, well built people, in stature being of about medium height. They are an active, intelligent, and peaceful people, and travelers speak highly of their hospitality. They are fond of their wine and tobacco, although if necessary their power of dietetic endurance is great. It is claimed that a Yakut is able to work three or four days without food or drink; to the writer, however, this seems to be a physiological impossibility and absurd. The wealth of a Yakut is estimated in proportion to the number of cattle he possesses.

The *Turcomans* are a wandering people, inhabiting the steppes of Turkestan, Persia, and Afghanistan, and to the west they are found as far as Anatolia. The tribes dwelling in the latter region have in the main many of the physical characteristics of the White Race. The Turcomans are mostly Mohammedans. They are inveterate slave-dealers, and in spite of their religious inclinations they will traffic in the followers of the "Prophet" as readily as they will in those of the "unbelievers." These people are also very much devoted to the raising and racing of fine horses.

The *Nogaians* are supposed to have been a once-powerful people on the shores of the Black Sea, but which have since lost power and prestige, and are now variously scattered among other peoples between the Volga river and the Caucasian mountains,

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many of them still remaining have been described as being of a very peaceful disposition and much devoted to the pursuits of agriculture, and others of them are said to be still nomadic tribes.

The *Kirghiz* are a nomadic people inhabiting the frontiers of Russia and China, and are found at various points from Lake Baikal to the boarders of the steppes of Siberia. In stature these people are described as below the medium; their physiogomy is that of the yellow race in general, and is described by European travellers as being "ugly." They are much devoted to their horses and almost always travel on horseback, thoroughly armed, and even prepared for war or for the chase. At the town of Shouraiahan many sedentary Kirghiz reside, and this serves as a market-place where most of the buying and selling occurs. Others are the *Uighurs*, the *Uzbeks*, the *Kumuks*, and the *Karakalpaks*, all of them different branches of the Turkish people; the languages spoken by them show remarkable uniformity.

The *Finns* extend from the Baltic Sea to the Obi. They are regarded to be the remains of a people once probably much more numerous than at the present time. They are of Mongolic origin, but have assimilated to a great extent the characteristics of the European. They are mainly hunters and husbandmen. A number of different branches of the Finnish people are recognized, among them being the *Ostiaks*, dwelling on the right bank of the Obi, and the *Vogouls*, on the eastern slopes of the Northern Urals. The Finns of Siberia comprise in

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the south the *Teleouts*, the *Sagaïs* and the *Kachintz*. They devote most of their time to hunting, fishing and agriculture, and are subjects of the Russian Empire.

In Eastern Russia the *Baskirs*, the *Teptiars*, and the *Metscheriaks* belong to the Finns. The first of these are the most numerous, they speak dialects which vary much in the different districts inhabited by them, but which, in the main, may be said to be composed of mainly Turkish and Finnish words with some Russian.

The Finns inhabiting the region of the Baltic Sea have long been under the rule of the Teutonic peoples, and hence their characteristics and customs have become greatly obscured; among them are the *Livonians*, the *Esthonians*, the *Ischorians*, the *Kyrids*, the *Ymes*, and the *Quaines*.

The Finns of Siberia may be divided into two groups: one occupying the south and the other the north. In the former group belong the *Teleouts*, etc. In the northern group belong the *Ostiaks* and *Vogouls*. The Ostiaks dwell mainly along the banks of the Obi, their main differentiating physical characteristic is red hair; in habits they are rather uncivilized, idolatrous, and devoted to hunting and fishing. The Vogouls comprise a small group dwelling to the east of the Oural, there has been considerable admixture between them with the Turks and Mongolians, and their physical characteristics have thus become greatly obscured.

The *Lapps*, or *Laplanders*, are a strong, hardy and active people, although small in stature. They

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have a brachycephalic skull, prominent cheek bones, and the characteristic Mongol face. Their complexion is yellowish-brown, and their hair is usually brown or of a chestnut color. This color of the hair seems to have been acquired since the time of Linnæus, for he describes it as being black.

The Lapps inhabit various portions of the area bounded on the north by the Arctic Ocean, on the northwest by the Atlantic, on the east by the White Sea, and on the south from 63° to 66° north latitude. This region has been termed Lapland, but the name is without any political status.

The Lapps are usually divided into two groups, the nomadic Laplander and the sedentary Laplander. The occupation of the nomadic Laplander is the taking care of his herd of reindeer. This useful animal serves them in many ways; they harness the reindeer to their sleds, they use the flesh for food, and the skin for the making of their clothes and tents. They also use dogs as animals of draught. The average nomadic Laplander leads a miserable existence. A tent serves as his place of abode all the year around. In the centre of the tent he has his fire-place, and an opening in the top permits the escape of the smoke. The skins of the reindeer are laid around the fireplace and serve as beds for the family. Their furniture usually consists of an iron pot and a few other utensils. The bladders of the reindeer are frequently used to carry milk and water in. In his habits the Lapp is uncleanly, good-natured, and always endeavors to take life easily.

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The sedentary Laplander is usually a poor fellow who has failed as a reindeer proprietor, and with his family has settled down on the sea-coast as a fisherman, while his wife spins wool. He is looked down upon by all of his more fortunate neighbors, and by the Swede and Norwegian is said to be despised. He differs in almost all of his habits from the people amongst whom he lives, and his children are not permitted to marry into the better classes.

As we proceed to the northeastern regions of the continent of Asia we find many tribes all possessing strong physical characteristics in common, although in language they differ in some instances quite decidedly.

The *Chukchis*, a tall, well-built people, with prominent features and a yellowish-brown complexion, occupy a portion of the region in the extreme northeastern part of the continent. They are hunters and fishermen.

There has been considerable diversity of opinion as to the origin and relationship of these people, it being considered by some that they may have been derived from a Manchu or Tungus people which long previously settled in the northeastern region and there amalgamated with the Onkilon aborigines.

The *Namollos* also dwell in this region, and in manners and habits differ but little from their neighbors. Their language is considered to be related to that of the Eskimos. To the south live the *Kamschatkans*. They are a small but hardy people. During the winter season they dwell in earth pits and in the summer in huts. Their most useful domestic

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animal is the dog, of a peculiar breed, which is employed in hunting and sledging.

On the lower Amoor and in Northern Saghalien dwell the *Giliaks*. They live generally on the banks of rivers or in the vicinity of the sea, and for their livelihood depend mainly upon fishing. During the summer they live in small houses constructed on piles, and during the winter in huts which are partially buried in the ground. Some of them have abundant beards, which feature among Asiatics is quite rare; owing largely to this characteristic some anthropologists have considered that they are related to the Ainos. Others consider them to be allied to the Tunguses. They are quite an intelligent people, and are usually inclined to indulge in trade, and in the selection of ornaments they are alleged to show considerable taste. According to Deniker, they probably do not exceed at present 5,000 individuals.

The *Aleutians*, of the islands of that name, which extend in a curve from the peninsula of Alaska to Kamschatka, are a people as to the origin of which anthropologists do not altogether agree. By some they are considered to be of American origin and by others of Asian origin. They are especially well known as daring and expert sailors in their hide canoes. They are of medium height; the nose is flat, and the skull is meso-cephalic. Their population at the present time is said to consist of about 2,000 individuals.

Inhabiting the northern portions of the archipelago of Japan dwell those people known as the *Ainos*.

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They differ decidedly from the *Japanese* in having a lighter complexion; their forehead is higher and broader, and their eyes are larger. These Ainos also have quite a covering of hair on their bodies. They depend mainly on hunting and fishing as a means of gaining a livelihood, and lead quite a primitive existence. The Ainos are generally considered to be a much older people than the Japanese.

According to the traditions of the Japanese, they reached the archipelago they now inhabit from the south and southwest, and gradually conquered the Ainos whom they found there, and gradually spread over the various islands. The Japanese physical type is characterized by a flat forehead, a small, well-formed nose, with nostrils slightly raised; the eyes are small and less oblique than those of the Chinese; the hair is black and not quite as straight as that of the Chinese; the average height is 5 feet 4 or 5 inches; the complexion is of an olive-yellow. These physical characteristics indicate that the Japanese cannot claim purity of descent; although mainly of Mongolic origin, these people have been modified by other blood.

Intellectually, the Japanese easily surpass all other Mongolian peoples, and they are now apparently prepared to take a position among the more advanced European nations. They are intelligent, progressive and heroic. Probably never in the whole history of the human species has any people so willingly, earnestly and quickly adopted a higher civilization as the Japanese have done. Japan possesses quite a rich native art and an extensive literature, treating mainly of practical subjects.

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CHAPTER IV.

THE RED (AMERICAN) RACE.

CONTENTS.—The characteristics and origin of the race. The Glacial Period in America and its bearing on the antiquity of man. The physical uniformity of the American Indians, their mental endowments, their culture and their languages. The Eskimos. The Algonkins. The Crees. The Chipeways. The Blackfeet. The Lenapes. The Iroquois. The Cayugas, the Senegas, the Onondagons, the Oneidas and the Mohawks. The Dakotas or Sioux. The Muskhogeans, the Choctaws, the Creeks and the Seminoles. The Caddoes. The Pawnees. The Yumas. The Pueblos. The "Mound Builders." The Sonora. The Nahuas or Aztecs and their civilization. The Toltecs. The Otomis. The Totonacos. The Zapotecs. The Mixtecks. The Mayas and their civilization. The Caribs. The Arawaks. The Tulpis, the Gês, the Crans, the Botocudos, the Coroados, the Puris and the Malalis. The Qquichuas or Incas. The Patagonians. The Fuegians.

WHEN the continent of America first became known to the civilized nations of Europe it was inhabited throughout its length and breadth by primitive tribes, which have become generally known to us as Indians, thus continuing the error first advanced by Columbus, when he supposed that he had found the western route to India.

The American Indians, or American aborigines, while differing in habits and customs in the different portions of North, Central and South America, nevertheless have certain strong characteristics in common which seem to prove almost to an absolute certainty that they all have descended from one original stock, and that there has not been

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that commingling of different peoples as was so common among the early inhabitants of the Eastern Hemisphere.

The general characteristics of the American Indian are that he is tall in stature, the hair is straight and black in color, the skull is variable, the nose is narrow, the jaws are straight, the cheek bones are high, and the skin is of a coppery or reddish hue. Owing to this latter character, which is, however, quite variable, the American aborigines are known as constituting the Red race.

The ancestry of the American Indians is a question about which there has been much discussion in the past, and which at the present time cannot be said to have been settled to the satisfaction of all anthropologists, although the consensus of opinion seems to be to consider that they are the descendants of the Yellow race, and probably reached North America by way of Behring Strait, although no less an authority than Dr. Brinton considers that: "So long as we have any knowledge of the movings at this point, they have been from America into Asia." The distinguished naturalist, Alexander von Humboldt, considered that the natives of Mexico presented all of the important physical characteristics of the Mongolian, excepting only the nose. The ethnologist, J. J. von Tschudi, says that he has seen Chinese whom at first sight he considered to belong to the Botocudos of Sierra dos Aimures. All of the aboriginal American tribes have long, heavy, stiff hair, which, on cross-section, exhibits a circular outline, and this latter feature

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alone is, perhaps, the strongest argument the anthropologists can offer in support of the Mongolian origin of the American Indians. The writer once heard the late Prof. E. D. Cope express essentially this same opinion.

Without going further into the subject of the route early man took to reach America, the next question to consider is: When did prehistoric man make his first appearance on this continent? This question cannot, of course, be answered positively, but geological data have furnished some valuable information on this subject.

During the pleistocene period a most important event occurred in the form of an enormous sheet of ice of great thickness that covered the greater part of Europe and America, in the former country reaching as far down as the fiftieth parallel of north latitude, and in the latter country in some regions as far as the fortieth parallel of north latitude. This period is known as the *Great Ice Age* or the *Glacial Epoch*. How long this ice mass remained intact is not known. It is fairly certain, however, that once, if not twice, this ice sheet receded, and thus we have two or more ice periods, thus also causing an "interglacial period." At this time great climatic changes occurred. From the glaciers great rivers flowed all the year around, and during the summer season flooded and inundated wide tracts of land, and in time deposited large quantities of sand, gravel and loam. This glacier was, from all indications, a moving mass of ice, pushing southward, carrying in front of it a long line of earth

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and boulders, such as the Alpine glaciers do at the present time.

During this ice period man lived in Europe, and it is highly probable that his advent into Europe was even long before the Ice Age. The remains of early man have been found many times in the glacial deposits of the Old World.

In North America, at this time, essentially the same physical conditions existed as in Europe. It touched the Atlantic Ocean in the neighborhood of Boston and New York harbors, and in Pennsylvania evidences of its presence have been found as far south as the fortieth parallel; it reached across the continent in an irregular line north of the Ohio and south of the Missouri Rivers. The fauna living at this time included the mastodon, a species of horse, bison, bear, tapir, peccary, and numerous other forms, together with the gigantic extinct forms of sloth, as the megatherium, the mylodon and the megalonyx. In the deposits of South America the remains of the great sloths and armadillos, as well as other mammals, have been discovered.

Evidence of the presence of a glacial period has also been found in South Africa. There also seems to have been a glacial period in Australia and New Zealand. In Northern and Central Asia it is probable that the glaciers were of great magnitude.

The subject of the glacial period in America is of especial interest to the anthropologist, for it at once raises the question: Did man live in America during this time?

In the year 1875 Dr. Charles C. Abbott found in

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the gravel deposits at Trenton, N. J., certain stone implements of human workmanship. These deposits have since become known world-wide as the "Trenton gravels." They are, without doubt, glacial in origin, and that the implements are the workmanship of man cannot be questioned. Since that time Dr. Abbott has found many paleolithic implements in these gravels. In gravels of the same age in Ohio, Dr. C. L. Metz has found several implements, as did also the late Dr. Hilborn T. Cresson, the latter finding a specimen of paleolithic implement in deposits of glacial age in Indiana, and another near Claymont, Del. Many other specimens have been reported at different portions of this country, but that any of these specimens are of the age that is assigned to them is the problem to be very seriously considered. In order for us to demonstrate positively that man lived in America during or immediately after the glacial period, we must know (1) that the deposits in which the implements are found are of glacial origin; (2) that the implements are of human origin; and (3) that the implements were deposited at the same time that the gravels were deposited. The first two conditions can very easily be accepted, but they are valueless without the last, and in all of the alleged discoveries of paleoliths in the glacial deposits of America it is questioned whether the implements and gravels were deposited at the same time. It is considered probable that the implements were not found *in situ* in the deposits, *i. e.*, were not deposited simultaneously with the gravels, but subsequently to that

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event. For example, a grave might be dug in a miocene formation during our own time, and various bones and implements might be here buried; now, if the grave were opened a generation hence it would not be legitimate for us to assign miocene age to these specimens. The subject of the antiquity of man in the Delaware Valley, as indicated by the study of the Trenton gravels, has received special consideration by anthropologists not only of America, but of the world, and the general tendency of opinion among them seems to be that the longer the investigation is continued the greater becomes the doubt as to the existence of man in America during glacial times. Prof. W. H. Holmes, in accounting for the origin of recent paleoliths in the gravels at Trenton, says: "Every bank that crumbled, every grave dug, every palisade planted, every burrow made, every root that penetrated and every storm that raged, took part in the work of intermingling and burial, and following in turn came the resettling, the leeching out and the recementing of these deposits, making it difficult to distinguish the old from the new. It follows, therefore, that the student of the history of this valley, and especially of that part of it recorded in the soil and superficial deposits, should not for a moment lose sight of these conditions and events of recent and comparatively recent history, and should seek first to explain all phenomena from the point of view thus afforded before conjuring up shadowy images of other races."

While the evidence up to date is not sufficient on

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the one hand to say that man existed here during the glacial period, on the other, we cannot demonstrate that he was not here during that time. We must, therefore, really assume the agnostic position on this matter; but, from the data furnished by the Trenton gravels, it seems fair for us to suspect the presence of man in this region when the gravels were deposited.

Some students of the antiquity of early man in North America have considered that perhaps the stone implements from Table Mountain in California, and that, also, the famous skull which was alleged to have been found in the deposits of auriferous gravel in Calaveras county, California, antedate the remains of man that have been found in the eastern portion of the United States. These stone implements seem, however, to be too perfectly executed to be considered as having been made by primitive man, and the record of the Calaveras skull is too unsatisfactory to be accepted; and, besides, there is much question as to what age the auriferous gravels should be assigned. Dr. Joseph Leidy, who described many remains from these deposits, doubted very much the antiquity of them as assigned by some authorities. Prof. J. D. Whitney considered that these gold-bearing gravels were of pliocene age, and by Prof. Joseph Le Coute they were assigned to the beginning of the glacial epoch.

All of the primitive nations of America possessed remarkable uniformity in their physical characteristics, and all attempts to classify the different tribes

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of the American Indians on physical criteria have been failures.

The mental endowments of the race were by no means low, and impartial investigators place the Red race next to the Yellow race in intellectual capacity, and consider it far superior to the Black race.

The prevalent idea that all of the American Indians devoted most of their attention to hunting and war is erroneous. In many portions of America, where conditions were suitable, attention was given to agriculture. Maize was cultivated where it would grow. Beans, gourds and tobacco were also cultivated. The Nahuas of Mexico and the Mayas of Yucatan tilled large fields, as did also the Iroquois and the Algonkins of the Atlantic Coast.

The domestication of wild animals by any primitive people is a sign of superiority, and in the case of the American aborigines, as far as the fauna would permit, they availed themselves of the opportunities that were present. Their dogs have become historic; they were domesticated from a species, or perhaps several species, of wolf, and were used for hunting, and in the north for draught. In Brazil the natives are said to have made pets of monkeys and parrots. In South America the llama was used as a beast of burden, and much valued for its hair. In the art of architecture many structures have been found which indicate no mean ability on the part of the builders, as in Mexico, Yucatan and Peru.

The American race was fond of music, and wind

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instruments and "drums" of different varieties were made. It is also probable that they were not altogether ignorant of stringed instruments.

In religious belief probably all American tribes, with the possible exception of the inhabitants of Terra del Fuego, believed in one or more supreme beings, and they all had their myths dealing with the exploits of their hero-gods. These myths differed greatly among the different nations and their religious ceremonies were various.

The native American languages are called polysynthetic, in that the structure of the sentence is merged in the form of the word. In British North America and United States fifty-nine irreducible stock languages have been recognized. The resemblances between these stocks is such, however, as to indicate a common origin. Dr. Brinton says: "Those best acquainted with American tongues praise them most highly for flexibility, accuracy and resources of xepression. They place some of them above any Aryan language." As linguistic differences can be recognized in the American tribes, when physical differences can not, language has greatly facilitated their classification, as a relationship of language indicates a relationship by blood. Major J. W. Powell illustrates this perhaps more clearly than can be done in any other manner by the linguistic map accompanying his work on the "Indian Linguistic Families of America North of Mexico."

Throughout almost the whole extent of Arctic America dwell the *Eskimos*, which term was first applied to them by Europeans. They call them-

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selves *Innuits* or men. Along the southern borders of their habitat they have for their neighbors the Indian tribes proper.

In stature the Eskimo is medium or slightly below the medium. The face is broad, round and flat. The skull is frequently dolichocephalic in the eastern tribes, but in the western tribes is brachycephalic. These people seem to be decreasing in numbers, and important causes seem to be sterility and infant mortality.

The Eskimos are of a bright, cheerful disposition; they appreciate humor and are fond of practical jokes. They show a remarkable aptitude in acquiring knowledge. They are fond of music, and have many native songs. They also have their games and pastimes, as well as their festivals of a semi-religious character.

The whole manner of their life is very uniform, and is dependent largely upon the supply of food at the different seasons of the year. They subsist largely upon the seal, the deer and the walrus. The flesh of the seal supplies them with food, the blubber furnishes them with fuel during the winter season, and out of the skin they make their clothes and tents, in which they live in the summer. In the winter they live in houses constructed of snow and ice. They are a very peaceful people, and wars between settlements are rare. Dr. Franz Boas, who spent considerable time among the Central Eskimos, was unable to find any records of a war having occurred, except a feud that was alleged to have happened seventy years before.

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The Eskimo makes a lamp out of stone and furnishes it with a wick of dried moss. They are experts in the use of their native boats or "kyaks," which are long, narrow canoes covered with skin. They also use snow-shoes. Their sleds with teams of dogs are exceedingly useful. "The social order of the Eskimo," says Boas, "is entirely founded on the family and on the ties of consanguinity and affinity between the individual families."

At the time of the discovery of America, in the region extending from the Rocky Mountains on the west, as far south as Delaware, and as far north as Labrador, thus including nearly all of the Northern States, dwelt the *Algonkin* nation. The Algonkins illustrate as well as any other of the American aborigines the characteristics of the Red race, and they may be considered as being typical examples of the race, both physically and mentally. They occupied quite an extensive geographical area in eastern North America, extending from Labrador and the southern shores of Hudson Bay, where they came in contact with the Eskimos, southward to Cape Fear and Cape Hatteras; it is difficult, in fact impossible, to determine how far west this stock extended, as the tracing of the relationships of all of the Indians of central North America is.

In Labrador and the southern shores of the Hudson Bay region dwelt the *Crees*. On the island of Newfoundland were the *Mic Macs*, a few of which, the writer found in 1900, still remain in the vicinity of Bay d'Espoir, although it is generally stated that they are extinct.

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On the shores of Lake Superior were found the *Chipeways*. In the region of the headwaters of the Missouri River dwelt the *Blackfeet*, and in the Delaware Valley, the *Lenapes*. In addition to these there were many other tribes, all occupying nearly the same plane of development and all quite similar in manners and customs. They were all skilled in the making of stone implements, and in aboriginal warfare. They dwelt in villages and were agricultural, raising maize, beans and tobacco. Their legends were many and they valued their ancestral history. They had a primitive system of writing, some specimens of which have been preserved. The inscriptions on the famous Dighton rock in Massachusetts, which at one time were considered by some archæologists to have been done by the Norsemen, are now known to have been of Algonkin origin. The Lenapes were also considerably advanced in the system of picture-writing.

The *Iroquois* extended from Canada southward to Pennsylvania and Ohio; they were surrounded on all sides by the Algonkins. The tribes of the *Cayugas*, *Senecas*, *Onondagons*, *Oneidas* and *Mohawks* bound themselves together into the "five nations," and as such were important factors in some portions of colonial history.

The *Dakotas* or *Sioux* inhabited the grassy plains between the Mississippi River and the Rocky Mountains and extended as far south as Arkansas.

They were divided into many tribes; in the southern section of their distribution dwelt the *Quapaws*, the *Kansas*, and the *Osages;* in the cen-

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tral region dwelt the *Poncas*, the *Omahas*, and the *Assiniboins*, and the *Crows;* and in the region about Green Bay on Lake Michigan dwelt the *Winnebagoes.*

Still further south, in the region of the headwaters of the Roanoke river, dwelt the *Tuscaroras*, which at a later date formed the sixth of the great nations. The *Cherokees* dwelt along the upper waters of the Tennessee river. In various directions all of these tribes showed great ability, and their intelligence must be considered to be among the highest. This was especially illustrated in their system of government, when the chief, Hiawatha, succeeded in his great scheme of linking together the five nations into one great confederation. Each nation was permitted to retain its own individuality relative to its own affairs, but such matters as concerned and affected all were controlled by a federal senate, which was composed of representatives elected by each nation. The ablest of the ruling chiefs were usually elected to be representatives in the federal senate. The idea intended by this federation was very elaborate, and it was intended to be indefinitely expansible, and had its objects been accomplished it would have been far more powerful and it would have wielded much more influence than it did.

The *Muskhogeans*, including the *Choctaws*, the *Creeks*, the *Seminoles* and a few other tribes, inhabited the region bordering on the Gulf of Mexico, and extended as far north as the base of the Appalachian Mountains. A few Seminoles still remain in some of the wilder portions of Florida.

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The *Caddoes* extended from the Gulf of Mexico west of the Mississippi River to the Platte River. The *Pawnees* belong to this group. So far as we know, they were not especially advanced in any particular, and depended largely on hunting and fishing as their means of sustenance.

The Rocky Mountain region was occupied by many different tribes who spoke many different stock languages, Geographically, the most important were the *Yumas*, who occupied the valley of the Colorado River and the peninsula of Lower California.

The *Pueblos* occupied portions of New Mexico and Arizona. They dwelt in large habitations, built of stone and sun-dried brick, which in some instances are large enough to contain a whole tribe. These edifices are frequently several stories high. These people were first visited by the Spanish in the year 1530. The Pueblos were agriculturists, and were also skilled in the making of pottery, as well as in spinning and weaving. From the ruins of the old habitations and the old pottery found, it is evident that at one time they were quite numerous. Throughout the region of the Colorado and Rio Grande Rivers, upon the cliffs overlooking the deep gorges, are found the "cliff-houses," which were built upon the ledges of the rocks. It is supposed that these buildings served as places of retreat from the more hostile tribes. Brinton has divided the Pueblos into three different stocks, the *Kera*, the *Tehua* and the *Zuni*.

Before considering the native tribes of Central

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America it is well that reference be made to the so-called "Mound Builders." At various portions of the United States between the Allegheny and the Rocky Mountains, especially in the Ohio Valley, and also in the Gulf States, are found a number of remarkable earth mounds. In form they differ considerably, being round, oval or square, and in some instances triangular in outline. In height they are from a few inches to nearly a hundred feet. The majority of them are burial mounds, others are defensive, and others again probably have a religious origin. Some of them represent certain animal forms, as mammals, birds and reptiles. It was formerly supposed that these mounds were constructed by a former race of people which occupied this country before the American Indians; but now such is not considered to be the case, and, in fact, it has been almost conclusively settled that they were constructed by the native Indians. On this subject Major Powell says: "With regard to the mounds so widely scattered between the two oceans, it may be said that mound-building tribes were known in the early history of discovery of this continent, and that the vestiges of art discovered do not excel in any respect the arts of the Indian tribes known to history. There is, therefore, no reason for us to search for an extralimital origin through lost tribes for the arts discovered in the mounds of North America."

At the time of the discovery of the continent, mound-building was probably still in progress, as some of these mounds have, without doubt, been

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finished since that time, because in some instances articles of European workmanship have been found therein. Dr. Cyrus Thomas, in his "Report on the Mound Explorations," cites instances where three small copper bells were taken from one mound, from another a piece of silver stamped with the Spanish coat-of-arms, and from another an old steel-bladed, bone-handled case-knife. These and many other facts show that these mounds are not as ancient as they were at one time supposed to be.

A number of tribes occupying Mexico and portions of the country north of Mexico have been united into a single group by Bushmann, which he has called the *Sonora*. He devoted particular attention to the phonetic system, the numerals and the grammar of these peoples, and from this study demonstrated the relationship of the *Tarahumaras*, the *Telpehuanas*, the *Coras* and the *Cahitas*. The *Moquoi*, the *Utes*, the *Comanches* and the *Shoshonees* or *Snake Indians*, from linguistic evidence, are considered to be related. All of these tribes show that their vocabulary has more or less been adopted from the Nahuatl language which was spoken by the people of Mexico.

The *Nahuas*, or *Aztecs*, occupied or controlled the greater portion of Mexico at the time the country was discovered by Cortez, and here they had developed quite a high stage of civilization. They had built up large cities, composed of thousands of houses of brick and stone. In these cities a thriving business was carried on, particularly on market days, and their merchants did an extensive trade, reaching well down towards the Isthmus of Panama.

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The Nahuas were an industrious, active and enterprising people. They were agricultural, raising maize, cotton, beans and tobacco, and in architecture showed their skill in their temples and monuments. They were familiar with the arts of making pottery and the weaving and coloring of fabrics. They were able to cut and polish the hardest stones, and possessed knowledge as to the fusing of metals.

The religion of the Nahuas was polytheistic, and their most important deity was the God of War. When Cortez visited Mexico he found attached to the temple about 5,000 priests. They were entrusted with the education of the young. The women were in many instances on equal footing with the men. Reading, writing and arithmetic were taught both sexes, as were also their astronomy and astrology. There were priestesses as well as priests.

The calendar of the Nahuas recognized the solar year of 365 days, which was divided into eighteen months of twenty days each, with the extra five days added to the last. The difference between the actual time of the earth's annual journey around the sun and their year was corrected by every fifty-second year intercalculating thirteen days. It is also probable that they knew the cause of eclipses.

Their writing was in hieroglyphic characters which were painted on paper made from the leaves of the magney plant. This system of writing has been called by Brinton the "ikonomatic method."

According to tradition the *Toltecs* are said to have come from the north and occupied this region

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prior to the time of the Nahuas; but the tendency among present writers seems to be to consider that the Toltecs were probably merely a tribe, and that all of the remarkable accounts as to their civilization have been greatly exaggerated.

Besides the Nahuas there were a number of other tribes in this region, which, while of interest to the specialist in American ethnology, are hardly of sufficient importance to be dwelt upon here.

The *Otomis* are of interest on account of the character of their language, which is largely monosyllabic. The natives whom Cortez first encountered on landing in Mexico are supposed to have been the *Totonacos;* they were considerably advanced in civilization, and in religion were sun-worshippers. The *Zapotecs*, at the time of the conquest, had made considerable progress. They were an agricultural people and dwelt in villages. Their neighbors, the *Mixtecs*, were on about the same plane of culture. All of these tribes indicate that their contact with the Nahuas was decidedly beneficial to them.

During pre-Columbian times, the Peninsula of Yucatan and the territory south of it to the Pacific Ocean were occupied by the *Mayas*. They are described to be of about average stature, with robust, bony frames, brachycephalic skull, which was sometimes artificially compressed.

The Mayas held out more strenuously and successfully against the Spaniards than did the Nahuas, and even at the present day their influence is still strong in Yucatan, where in the inland portions a knowledge of the Maya language is necessary to

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hold intercourse with the natives. In some portions it is said that even the descendants of the Spaniards have forgotten their mother tongue. The large majority of their towns are known by their native names.

While these people were probably never visited by Columbus, it seems, nevertheless, that he had heard of them. It is well known that Columbus in his first three voyages did not reach the continent of America. On his fourth and last expedition, however, he discovered a small island known to the natives by the name of Guanaja. This island was probably the one now known as the Island of Bonaca, off the coast of Honduras. While on this island he saw a canoe filled with natives coming from the west. In reply to the inquiries of the Spaniards as to gold, they pointed to the we stand unsuccessfully endeavored to persuade Columbus to accompany them. In the words of Washington Irving, as quoted by Stephens, "Well would it have been for Columbus had he followed their advice. Within a day or two he would have arrived at Yucatan; the discovery of Mexico and the other opulent countries of New Spain would have necessarily followed. The southern ocean would have been disclosed to him, and a succession of splendid discoveries would have shed fresh glory on his declining age, instead of its sinking amid gloom, neglect and disappointment."

The first European to visit Yucatan was Francisco Hernandez de Cordova, in the year 1517. Although many expeditions were sent out and attempts at conquests made, it was not until 1541 that a perma-

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nent settlement was established. In this year the younger Francisco de Montejo went into the country to the site of an ancient town called Ichcanziho, to which he gave the name of Merida, the present capital of Yucatan.

The Mayas were one of the most cultured of the American aboriginal peoples, and it seems probable that they may have been descended from the Nahuas, although their traditions, monuments, hieroglyphics and language differ. They were particularly adept in the art of architecture, and their building material was usually a hard limestone. Their monuments usually face the cardinal points. The buildings were erected largely on the pyramidal form, rising from a broad base through a series of steps to the summit. The highest of these pyramids was less than 100 feet. The base sometimes occupied considerable space, as that of Zayi, near Uxmal, had a periphery of over 1,500 feet.

The Mayas were familiar with the bow and arrow, the lance, and the blowpipe or sarbacane, and were quite expert in war and the chase; but, nevertheless, they were essentially an agricultural people. Maize was their most important product, and they also raised beans, peppers, cotton and tobacco. Copper and gold were their important metals, and they were familiar with silver, but were not acquainted with iron. These metals were used mainly for decoration, and it is doubtful whether they understood the art of smelting. The Mayas constructed rafts and canoes, which they were able to navigate with great skill, and it is alleged they were familiar

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with the sail. They had their gods, but we know very little about their religion. Human sacrifices did not take place as frequently among the Mayas as among the Nahuas. Sacrifices, when they did occur, were followed by several holidays, and dancing, banquets and drunkenness were indulged in, as they were acquainted with several fermented drinks.

According to Dr. Brinton, essentially the same calendar system was in use among the Mayas as that which was used by the Nahuas, and Dr. Cyrus Thomas considers there is in these calendars some evidence of a Polynesian influence.

The Mayas were familiar with the art of writing, and employed the so-called "calculiform" hieroglyphics, so named from their resemblance to the outline of calculi or pebbles. Associated with these characters are certain crude drawings, frequently of their gods, of which the hieroglyphics are supposed to be descriptive. The hieroglyphic writing of the Mayas has been preserved on stone, wood, pottery and sheets of native paper. Of the latter, four manuscripts, or "Codices," are known to be in existence. Much time and labor have been expended on the deciphering of these works, but thus far the result has not been as satisfactory as could be desired. There are a number of different tribes included in the Maya stock, each differing to a slight extent in language and customs.

On the continent of South America the so-called "hunting tribes" predominate, and only in or near the Andes do we find tribes which are to any extent civilized. Their languages differ greatly, and no

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attempt has been successful in classifying them satisfactorily, as has in some instances been fairly well done with the native North American tongues.

On the northern coast of South America, particularly that portion bordering on the Caribbean Sea, dwelt the *Caribs*. They were an intelligent people and were good sailors, and are said to have established a colony in Hayti, although they were cannibals. Inhabiting the coast between the rivers Orinoco and Amazon were found the *Arawaks;* the greater and lesser Antilles were also occupied by them; some cultivated the soil and made their garments from wild cotton, which they were able to spin and weave; they were probably the first natives Columbus came in contact with in the new world.

Throughout the vast territory drained by the Amazon River are a large number of different tribes whose relationships are very obscure. The early explorers in this region found first the *Tulpis*, and under this name a large number of different tribes have at times been included. The territory drained by the Tocantin River was occupied by the *Gês*, and also the *Crans*, to which were related the *Botocudos*, the *Coroados*, the *Puris* and the *Malalis*.

The people possessing the greatest culture in South America were the *Qquichuas*, or *Incas*, of Peru. They extended in the Andes region from about the equator southward for a distance of at least 2,000 miles in length, and in width from 200 to 400 miles. The origin of the Qquichuas is unknown, but from the extent of their architecture it is certain they had been developing for a long period of time.

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They erected many remarkable stone buildings, forts, walls and bridges. Water, which is so highly valued in tropical climates, was collected in reservoirs, and through aqueducts was frequently conveyed many miles. They were familiar with gold and silver, and were expert in manipulating these metals, making articles of various kinds with mathematical precision. They were acquainted with the art of weaving cotton and the wool of the llama and alpacas. They were able to make their fabrics of different colors, as they were conversant with methods of dyeing.

Their most important domestic animal was the llama, which they used for carrying burdens, for food and for wool. The dog was also domesticated, and also a species of fowl. Their most important agricultural products were maize, cotton, coca, potatoes and tobacco.

The Peruvians gave especial attention to the mummification of the dead, and interred the remains in sepulchres. They believed in the immortality of the soul, and worshipped the sun, moon and stars. In certain districts they worshipped particular animals; in others the mountains and the sea.

So far as we know they were acquainted with no system of writing, and with no method of numeration. As a substitute it seems they used the quipos, which consisted of strings of different lengths, knotted in various ways to have certain significations. Their pottery exhibits great beauty, and was made in many different designs.

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The *Patagonians* are a roaming set of people of large physique; they care but little for improvement, and have but few religious rites, although they are alleged to salute the new moon.

They call themselves *Chonek* or *Tzoneca*, or *Inaken*, which signifies the men or the people, and by their more northern neighbors they are referred to as Tehuel-Che, which signifies the southerners. An interesting fact relative to their language was pointed out by Ramon Lista; he compared many words in their present vocabulary with the vocabulary collected by Pigafetta on his voyage in the year 1520, and he has shown that since that time little or no change has occurred.

On the barren land of Terra del Fuego dwell the *Fuegians*. In culture they occupy quite an inferior position, which is probably more the result of their environment rather than any inferior mental development. They are without government and go almost naked. A redeeming feature, however, is that they have domesticated a native species of dog, the friend and companion of man in every latitude.

There are three groups of people recognized as inhabiting Terra del Fuego. One of them being the *Yahgans*, or *Yapoos*, on the Beagle canal; another group is the *Onas*, or *Aonik*, to the north and east of the Yahgans; and the third is the *Aliculufs*, which dwell to the north and west. As would naturally be expected, they are all in about the same stage of culture, and the ordinary family ties are said to be almost entirely lacking. In the arts of hunting and fishing, however, they show

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considerable ingenuity. As to their weapons, they have the sling, the bow, the bola, and the lance. The women are quite clever in the making of strong reed baskets. The bark canoes made and used by the Fuegians are considered to be quite seaworthy.

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CHAPTER V.

THE WHITE (EUROPEAN) RACE.

CONTENTS.—The physical characteristics of the races. The race in the region of the Mediterranean Sea. The South Mediterranean branch. The Hamites. The Berbers. The Libyans. The Moors. The Numidians. The Guanches. The Rifians. The Egyptians and their culture. The East Africans. The Bedjas. The Daakals, or Afars. The Gallas. The Somalis. The Massi. The Semites. The Arabs. The Abyssinians. The Armenians. The Syrians. The Assyrians. The Babylonians. The Jews. The North Mediterranean branch. The Basques. The Aryans and their origin. The Umbrians. The Samnites. The Latins, or Romans. The Celts. The Highland Scotch. The Irish. The Manx. The Welsh. The Teutons. The Goths. The Vandals. The Angles and Saxons. The Danes. The Norsemen. The Franks. The Lombards. The Swedes. The Norwegians. The Icelanders. The Germans. The Slavs. The Huns. The Russians. The Ruthenians. The Poles. The Czechs. The Bulgarians. The Wends, or Sorbs. The Letts. The Albanians. The Illyrians. The Armenians. The Baktrians. The Persians. The Caucasic peoples, their languages and their tribes.

IN the history of mankind the most important and successful peoples have been those of the White race. From the humblest of beginnings, as primitive as any of those with which we are familiar, the race has struggled onward, overcoming all obstacles, adapting itself to various environments, and finally has succeeded in attaining the highest human development with which we are acquainted.

The physical characteristics of this race are more variable than those of any of the other races, the

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reason being probably because the race has existed under more diverse environments than any of the others.

The individuals are usually possessed of a whitish-colored skin, which may be very florid or ruddy, merging in some instances into a dusky or swarthy complexion; or in some instances again it may be of a light olive, or some of the various shades of brown.

The hair is flaxen, light brown, black, or sometimes red. On cross-section it presents an oval outline. It is usually wavy, with a tendency to be curly.

The skull is generally mesocephalic, with the tendency, however, to present considerable variation.

It has long been recognized that many of the oldest peoples of the white race have dwelt in the region of the Mediterranean Sea; the race, in fact, is sometimes referred to as the Mediterranean race. The real significance of this distribution on the part of this race has not, however, been fully recognized until comparatively recent years, but now it is considered by some of the ablest anthropologists that the White race possibly originated at some point in the basin of the Mediterranean, and there are a number of reasons which seem to indicate that Northern Africa may have been the region where the White race first became differentiated.

From miocene times many geological changes have occurred in this region, and the contour of the Mediterranean has been considerably altered. Land connections of quite an extensive size seem

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to have been present during pliocene and post-pliocene times, connecting Northern Africa with Southern Europe. This explains the geographical distribution of many of the plants and animals of this region, and at the same time makes it highly probable that the migrations of early man were affected thereby.

Dr. Brinton considered the White race to be "geographically and historically an African race," and he pointed out that, when the inhabitants of the three great continents became known, the White race possessed in Asia, 2,500,000 square miles; in Europe, 3,000,000 square miles; and in Africa, 3,500,000 square miles.

The close association of the White race to the Mediterranean region results in the very natural division of the race into two groups: the *South Mediterranean* branch and the *North Mediterranean* branch.

The South Mediterranean branch comprises the *Hamitic* and the *Semitic* peoples.

The Hamites occupy North Africa from the Mediterranean to the Soudan, and along the coast region of Eastern Africa, north of the equator, to the Atlantic Ocean. They are divided into three groups: the *Berbers*, the ancient *Egyptians*, and the *East African*.

The Berbers include the *Libyans*, the *Moors*, the *Numidians*, the *Guanches*, the *Rifians*, and other peoples. All of the Berbers are readily identified as members of the White race; the brunette type predominates, although blondes are found. Their

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language, while furnishing many dialects in different sections of the country, presents in general great uniformity. The Berbers have inhabited their present locality from the earliest times, and there is every reason to suppose they are the indigenous inhabitants; and, although there have been many expeditions of conquest into their territory at various times, they have preserved their racial purity with great tenacity. Their government consists of villages united into federations, which at times have been quite powerful. About 1400 B. C. they had an army against Egypt consisting of 30,000 men. "At that date," says Brinton, "the nations of the North Mediterranean branch were yet in the stone age, and the sites of Greece and Rome were the homes of savages." The Berbers were one of the most cultured of the early members of the White race, and while they have not kept pace with the development of human progress, they nevertheless largely retain their early culture.

Confined in the narrow limits of the valley of the river Nile, shut off from the rest of the world by continuous deserts, we find the most cultured people of antiquity, the ancient Egyptians. Judging from their skeletons, they resembled the other members of the White race in general, and their neighbors, the Berbers, in particular. In the modern Egyptian the stature is medium; the skull is dolichocephalic; the hair is dark and straight, or slightly curly; the nose is long and straight, or aquiline. In color the Egyptians were among the darkest members of the White race, varying from a

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yellowish-white to a reddish-brown. By the ancient Greeks they were considered to be quite dark. Herodotus calls them "blacks." They probably did not differ very materially from the Copts of the present day.

In intellectual development and civilization the ancient Egyptians occupied a high position. Intellectually they possessed much subtlety and acuteness. They were devoted to science, to literature, and to art. They possessed a literature embracing works on philosophy, mathematics, religion, law, medicine, and other departments of knowledge. Their architecture was massive, but was lacking in the higher qualities of art.

While the Egyptians possessed many of the virtues of later civilized peoples, they, nevertheless, indulged in many vices. Drunkenness was not rare among them, and was indulged in by the young as well as by the old. Dyes, cosmetics, false hair, etc., were used by the Egyptian beauties, which have long since faded into withered mummies, for the same purpose as they are used by the society belles of the present day. Games and sports of many kinds were popular. Banquets were common, and the costumes worn were magnificent. Theoretically they had a moral code, but as a rule it was not put into practice.

Strong evidence of Egyptian development is shown in their calendar. The year was divided into twelve months, which were divided into three weeks of ten days each, to which were added five extra days. Their system of hieroglyphic writing con-

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tributed greatly to the advancement of civilization, their records containing the earliest phonetic characters known.

The country they inhabited doubtless contributed largely to the early ripening of their culture, the regular rise and fall of the waters of the Nile being very favorable to their agriculture.

The antiquity of Egyptian culture can only be estimated approximately. The first dynasty was founded by King Mena about 4000 B. C., but at this time their civilization was thousands of years old, being far more ancient, so far as we know, than that existing at any other region on earth.

Inhabiting East Africa from the Mediterranean to the equator are a number of peoples belonging to the Hamitic stock, which constitute the East African group. Of these the *Bedjas* occupy a large portion of the territory between the Nile and the Red Sea, extending into upper Egypt. Physically they are considered to be quite a well-developed people. The *Daakal*, or *Afars*, inhabit the southerly shores of the Red Sea, extending as far as the Strait of Bab-el-Mandeb. The most numerous are the *Gallas*, being estimated, according to Keane, to consist of "from 7,000,000 to 8,000,000, spread over a territory of 400,000 square miles." They dwell in South Ethiopia, and also in portions of Abyssinia. Inhabiting this region are also the *Somalis*. They are described to be a handsome, well-developed people. Farther to the south dwell the *Massi*, and other tribes which are greatly dreaded by the negro tribes of this region on account of their warlike tendencies.

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The habits of all of these people are nomadic; they dwell in tents, which are easily shifted from place to place. Their government consists of small communities ruled over by a chief. Very little attention is given to agriculture and the pursuits of peace.

Many of the East African tribes show signs of admixture with the Black race, or, more frequently, with the Semites.

The Semitic stock comprises the *Arabian*, the *Abyssinian* and the *Chaldean*. They all occupy mainly Western Asia and portions of Eastern Africa. They are more bearded than the Hamitic peoples, but beyond this perhaps no constant physical characteristic for differentiation can be found. It is considered, from linguistic evidence, that the Hamites and Semites originally developed in the same primeval home, but at what time the separation and differentiation occurred is at present a matter of conjecture.

While the Semites are mentally quite clever and original, they lack that perseverance which is so necessary for permanent progress. They appreciate the beautiful and have a powerful imagination; but in philosophy and science they have made very little progress. In art their main production has been in glass, pottery, textile fabrics and the sculpture of Assyria.

The Arabian group, as the name indicates, dwell in the great peninsula of Arabia, where, for thousands of years, they have roamed this great country, which is nearly one-third as large as the continent of Europe.

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The Arab, or Bedouin, recognizes the authority of no master. Associations of kindred are continued only so long as the interests and companionships are agreeable. Where differences relative to important matters arise, a friendly separation is mutually decided upon.

Among the Arabs close matrimonial alliances of kinship are common. The Arab ages early, at forty years of age becoming gray, and at sixty he is old. While his period of life is short, it is rarely hampered with disease. From infancy he is accustomed to endure without complaint. He is accustomed to live out of doors, sleeping for a few hours on the ground, eating sometimes but once a day and still enduring physical strain without complaint. Friendship is very highly prized among them, and the guest is considered sacred in the Arab camp.

The Abyssinians are probably descended from ancestors that originally came from Arabia. At what period this migration occurred is unknown, but it was certainly long prior to the present era. These people, unlike the Arabs, cannot pride themselves on being a pure-blooded race, as they show unmistakable evidences of racial admixture with the blacks and other ethnic elements. Their features are negroid, their hair is crispy, and the color of their skin is brown. The soil of Abyssinia is fertile, and the inhabitants are devoted mainly to agriculture and manufacture.

In the Chaldean group are found peoples exhibiting elements of exceedingly diverse origin. Here belong the *Armenians*, the *Syrians*, the *Assyrians*,

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the *Babylonians*, and the *Jews*. From very early times interminglings with other ethnic groups occurred among these peoples, sometimes evidently with the Hamites, as well as probably with peoples of the North Mediterranean branch.

The different groups comprising those members of the North Mediterranean branch of the White race do not show the uniformity in appearance, language and customs, which to an extent so largely characterizes the South Mediterranean branch. The peoples north of the Mediterranean have developed under a different and more diverse environment and hence greater differentiation has occurred, which makes the relationship of these populations much more obscure.

The North Mediterranean branch comprises the *Basques*, the *Aryans*, and the *Caucasic* peoples.

The Basques form one of the most isolated groups of people found in Europe. They inhabit both sides of the Pyrenees, on the frontiers of both France and Spain. They formerly occupied the whole of Spain and Southwest France; but their habitat has since become restricted by wars waged with other peoples, particularly by the Celts, until now it has been estimated they do not exceed 300,000. They formerly spoke Euscara, and called themselves Euscaldunac. By the old geographers they were called Ibernians. The early history of the Basques is veiled to a considerable extent in obscurity. The medieval historians refer to them in a very unfavorable manner, and the pilgrims eight or nine centuries ago dreaded them when they crossed the

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Pyrenees, in which region they were largely brigands. The origin of the Basques is unknown, although it is certain they constitute one of the oldest, if not the oldest, groups of people in Europe. Their language possesses characteristics which place it among the primitive forms of human speech. Although a Basque physical type is denied, there are, nevertheless, alleged to be certain physical and linguistic resemblances which would seem to connect them with the Berbers.

The Aryans are synonymously referred to as the Indo-European or Indo-Germanic peoples. Geographically they may be separated into an eastern and a western branch. With the exception of the Basques, the Magyars, the Finns and the Turks, they constitute the inhabitants of Europe. The eastern branch includes the inhabitants of Persia, of Armenia, of Afghanistan, and of North Hindustan. The relationship of the peoples inhabiting these different sections of country has been established by the study of their languages; but none of the known Aryan tongues can be said to be the original parent stem from which the other forms were derived, although the deduction of linguists is that a people did at one time exist which spoke the Aryan mother-tongue. Says Dr. Isaac Taylor: "The origin of the Aryan languages is veiled in the remote past, and the causes which gave rise to their divergences must be to a great extent a matter for conjecture."

It was formerly considered that the Aryans originated in Asia and later spread into Europe, but at

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the present time the general tendency of opinion among ethnologists seems to be that the Aryans originated in Europe and later extended their distribution into Asia. We know that Europe has been inhabited by man from those remote ages when he was contemporaneous with the cave bear, the mammoth, the rhinoceros and other extinct forms. It is also reasonably certain that Europe has been continuously populated since that early time, and it is supposed the present inhabitants are the descendants of these early people.

The European origin of the Aryans, Dr. Brinton says, was first advanced by the Belgian naturalist d'Omalius d'Halloy in the year 1839, although it is generally considered to be due to the work of the late Dr. Robert G. Latham that the old and generally accepted belief of the Asiatic origin was first questioned. Latham maintained in the year 1851 that a European origin was probable, and contended that the main body of the Aryans were in Europe, while in Asia a small detached body of them are found. He reasonably maintained that it was far more likely that the smaller body had come off from the larger rather than that the larger had come off from the smaller. Such an eminent scholar, however, as Prof. F. Max Müller writes in 1887: "If an answer must be given as to the place where our Aryan ancestors dwelt before their separation, . . . I should still say, as I said forty years ago, 'Somewhere in Asia,' and no more."

The Aryan linguistic family includes ten groups of languages, the Hellenic, the Italic, the Celtic, the

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Teutonic, the Slavonic, the Lithuanic, the Albanian, the Armenian, the Iranic, and the Indic. The first seven of these were the languages spoken by the Aryans of Europe, and the last three were the languages spoken by these people in Asia.

By far the most important of the Hellenic peoples were the ancient *Greeks*. It is likely that the separation of the Greeks from the Aryan parent-stem occurred in the valley of the Danube. Their language is considered to present strong relationship to the ancient Persian and Sanscrit, and also to have been influenced by the Semitic and Hamitic peoples. Owing to the comminglings the Greeks have undergone with other peoples, their physical and linguistic characteristics have become greatly changed. Mentally these people were in many respects far superior to all others of their time. In philosophy, mathematics, architecture, mechanics, art and literature, their position is so familiar to all that comment here is unnecessary.

The Italic peoples occupied the peninsula of Italy. In the north were the *Umbrians;* and in the south the *Samnites* and *Latins*, or *Romans*.

The Celtic peoples two thousand years ago were a most important group in Central and Western Europe; their living representatives are the *Highland Scotch*, the *Irish*, the *Manx*, the *Welsh*, and the natives of French Brittany.

The Teutonic peoples in ancient times included many different groups, the more important being the *Goths*, the *Vandals*, the *Angles*, and *Saxons*, the *Danes*, the *Norsemen*, the *Franks*, and the *Lom-*

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bards. These divisions are made on linguistic data, and most of them no longer exist. The Gothic language is no longer spoken. In Iceland and the Faroe Islands, however, the old language of the Scandinavians is still used, and on the continent has given origin to the Dano-Norwegian and the Swedish. At the present time the Teutonic stock of nations may be divided into two main branches: the Scandinavian, including the *Danes*, *Swedes*, *Norwegians* and *Icelanders;* and the Germanic, embracing the *Germans* and the inhabitants of Switzerland, the Netherlands, the *Flemings* of Belgium; also the descendants of the Angles, the Saxons and the Jutes in Great Britain, together with their descendants, the English-speaking people of the world.

The Slavonic stock, or the *Slavs*, inhabited Europe from early prehistoric times. The earliest historic notices represent them as inhabiting the region about the Carpathians, from which section they spread northward to the Baltic, westward to the Elbe and the Saal, and, after the overthrow of the *Huns*, southward to the Danube, and over the peninsula between the Adriatic and the Black Sea. They are represented by the early writers as an industrious people, devoted mainly to agriculture and the rearing of flocks and herds; they were peaceful and hospitable, resorting to war only as a means of defense when they were compelled to do so. The descendants of the Slavs living at the present time are the *Russians*, the *Ruthenians*, the *Poles*, the *Czechs*, the *Bulgarians*, and the *Wends* or *Sorbs*, dwelling in Saxony and Prussia.

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The Lithuanic stock, which includes the *Letts*, dwelling on the shores of the Baltic Sea, are comparatively few in number, but are of importance, mainly on account of the fact that they are supposed to be the oldest people of Aryac stock living at the present time.

The Albanian stock inhabit a portion of Western Turkey along the Adriatic Sea. Their language is said to represent an isolated form of Aryan speech. They are but little more than half civilized, and have occupied a rather inconspicuous place in history. The *Albanians* are considered to be descended from the ancient *Illyrians*.

The Armenian peoples have been known under this name since the time of Herodotus and probably earlier, but their early history is largely veiled in obscurity. The modern *Armenians* are found in nearly all of the Turkish provinces, and also in Russia, Persia and India.

The Iranic peoples in ancient times comprised the *Baktrians* and *Persians*. Their modern representatives are the Persians, some of the tribes of Afghanistan, Luristan, Kurdistan, and the Ossetes, dwelling in the valleys of the Caucasus. Many of these people in times gone by occupied important positions in the history of the race, especially the Baktrians, whose language was the Zend.

The Indic group inhabit an extensive region of Southern Asia, which, second to that of China, is the most thickly populated area on earth. It has been estimated that this population began over 4,000 years ago. The earliest form of Aryac speech

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found in India is the Vedic. Later, through the cultivation of grammatical and phonetic studies, the Sanscrit resulted. At present there are many different tribes and castes inhabiting the great Indian peninsula, the forms of speech spoken by them presenting numerous diversities. Brahminism and Buddhism originated in India. The former is pantheistic and still has numerous followers; the latter is theoretically atheistic, and at the present time has more adherents than any other religious system.

The Caucasic peoples inhabit mainly the Caucasus Mountains, which extend from the Black Sea to the Caspian; the general direction of this mountain range is west-northwest to east-southeast. The length is about 750 miles, extending from the Peninsula of Taman on the Black Sea, to the Peninsula of Apsheron on the Caspian. The breadth is about 150 miles, but that of the higher Caucasus is not over 70 miles. This region is Asiatic in character, although it is sometimes referred to as part of the boundary between Asia and Europe. The higher and central portions of this range are connected by a series of elevated plateaus, which are intersected by fissures of great depth. At the upper portion of the range these mountains diminish in height, those along the shores of the Black Sea being only about 200 feet high. Some portions are without forests, while other regions are extensively covered with woods. In certain portions grain is grown at a height of 8,000 feet, and in the lower valleys rice, tobacco and cotton are produced. As might be expected, the climate of the northern and southern slopes differs considerably.

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The term Caucasian, as applied to the inhabitants of this region, was introduced by Blumenbach, who made it one of the fundamental ethnological divisions of mankind. Later ethnologists, however, do not give these people such important status, but consider them to be merely one of the important divisions of the North Mediterranean branch of the White race. The name Caucasian, when applied to the White race in general, is clearly a misnomer, although usage has, to an extent, given it sanction.

The Caucasus has been occupied by man since paleolithic times, as is recognized from human remains which have been found in a cave thirty miles from Kutais. The people inhabiting this region at the present time present great diversities, particularly linguistic differences. Many of the languages spoken are totally distinct from each other, and, with a single exception, do not present affinities with other tongues. When the Romans endeavored to explore the region it was necessary for them to obtain the assistance of seventy interpreters. The *Lesghians*, the *Avars*, the *Galgai*, the *Kishi*, the *Tushi*, the *Karabulaks*, the *Kurini*, and a number of other tribes occupy Daghestan, or the northern slope of the eastern Caucasus. Their westerly neighbors comprise the Circassians, the *Abkhasians*, the *Kabards*, the *Shapsukhs*, and others. The Georgian tribes have probably the oldest culture, and the beauty of their women is renowned. The *Ossetes* or *Ossetians* living in the centre of the Caucasus, on the slopes about Kazbek, are considered to be a people of Aryan origin.

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CHAPTER VI.

THE INSULAR PEOPLES.

CONTENTS.—The Malays. The Hovas. The Polynesians. The Maoris. The Tongas. The Tahitians. The Pomotonans. The Marquesans. Inhabitants of the Philippine Islands. The Tagalas. The Bisayas. The Ilocanes. The Pampangos. The Igorrotes. The Tingianes. The Apayos. The Bogobos. The Samals. The Andamanese. The Papuans. The Fijians. The Melanesians. Australia and the Australians. The Tasmanians.

THE many islands of the great oceans are inhabited by various peoples, sometimes presenting great diversities and showing evidences of various ethnic relationship, but as a rule resembling most closely those races inhabiting the continent they are geographically nearest to.

The *Malays* inhabit the peninsula of Malacca, the islands of Java, Borneo, Sumatra and the Celebes, and are found, in fact, on almost all of the islands from Madagascar to Eastern Island. Through all of this great area they present physical and linguistic affinities which bind them all together in one large group and indicate for them one common origin.

The average Malay is of medium stature, with a rather lithe and active body; the eyes are somewhat oblique, the cheek bones are prominent, the nose is rather flat, the hair is black, and the beard is scanty. The complexion varies from an olive shade to a brown color. The Malay type may be said to

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possess such characteristics as to at once identify it as being Mongoloid in character.

In their habits the Malays may be energetic or indolent. They are reckless, careless and cruel, having very little interest in civilization, and place very little value on human life or property. They are very revengeful, and have neither honor nor gratitude, and are without respect for veracity. The Malay, however, has considerable intelligence, and his love of gold has made him a daring navigator, his expeditions frequently combining the duties of explorer, merchant or pirate, just as circumstances may develop.

The island of Madagascar is inhabited by three groups of people, the *Hovas*, the *Malagasies* and the *Sakalavas*. The Hovas occupy Imerina; they are savages, or at the best barbarians; some of them are agriculturists, while others among them are shepherds and traders. They are generally considered to be of Malay stock, but as to this there is much difference of opinion. Dr. Deniker considers that the Hovas arrived in Madagascar only seven or eight centuries ago, but what evidence there is to support such an opinion he does not state. The Malagasies inhabit especially the east coast region of the island, and they are all decidedly negroid in character. The Sakalavas are quite generally distributed over the island, and many different tribes of them are recognized all of which vary more or less in character and culture, from savagery to barbarism. Many and divergent have been the views expressed as to when and from whence Madagascar

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was first populated by human beings, and it seems to be exceedingly doubtful that the time will ever be even very closely approximated.

The coast region of Borneo has for centuries been occupied by Malays, except in the northeastern part where the *Bajans*, the *Sulus*, and the *Illanuns* dwell. The interior of the island is inhabited by the Dyaks, which occupy a very inferior position in the scale of human development. Many of their customs are very curious, and some of them are very revolting. They are "head-hunters" and cannibals, it being considered among them that the greatest trophy of war is to bring home the head of the dead enemy. They dwell in the communal state, and their religion is idolatry, their gods being made of wood. The Dyaks practice different forms of self-mutilation, such as lengthening their ear-lobes, filling their teeth, and extracting their eyebrows. Human sacrifice is also practiced by these people. Some of them give attention to agriculture.

Linguistically the Malays may be separated from the Asiatic Mongolians, as all of their languages belong to the Malayo-Polynesian family, extending across the Indian and the Pacific Oceans from Madagascar to Easter Island, and from New Zealand north to the Hawaiian Islands.

The island of Sumatra is peopled by the independent tribes of the *Battas* dwelling in the north; and the *Kubu*, and the *Lubu*, in the south. All of these people are savages, and most of them are cannibals, although they do devote some of their time to agricultural pursuits. The coast region of

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the island is occupied by various tribes, some of them being the *Menangkaban*, the *Achinese*, the *Palenbangs*, the *Rejangs*, the *Passumahs*, and also the Malays.

In the western portion of the island of Java dwell the *Sundanese*, and in the eastern portion are the *Javanese*. Both of these peoples possess considerable intelligence. The ancient language of the Javanese was the Kavi, which is to an extent preserved in their sacred books. Over 2000 years ago it is considered that they had adopted some form of the Hindu religion, and under the instruction of Hindu teachers they became more cultured. The natives of Java are well-known in the east as accomplished musicians.

The Polynesian or South Sea Islands are distributed over a large territory stretching over a hundred degrees of longitude, from New Britain to Eastern Island, and across seventy degrees of latitude, from Hawaii to Stewart's Island. The people inhabiting these many islands, probably from prehistoric times, are known as *Polynesians*. They are tall in stature, and are proportionally well developed. The complexion is olive, varying to brown. The features may be said to be expressive, with a rather high forehead and dark eyes; the mouth is well proportioned and the teeth are well developed. They have long, straight, black hair. The languages spoken by them present strong relationships to the Malayan, and their traditions point to the west as the direction from which their ancestors came. That other blood besides that of the Malay is present in them cannot be doubted.

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In some respects the Polynesians can be considered to be an improvement over the Malays; they are more trustworthy. They build canoes and are excellent navigators. They catch fish, but do very little hunting. They depend also on the cocoanut groves and certain tuberous plants, as the sweet potato and the taro. Their domestic animals are the dog and the pig, both of which were probably introduced at a comparatively recent date. Their weapons of war consisted of the spear, the sling and the war-club; their implements of stone were polished. Cooking was largely done by means of heated stones. Their dwellings were usually built of brush and leaves, although on some of the islands stone buildings have been found.

The religion of the Polynesians is polytheistic, and they worship the powers of nature personified. The "taboo" is an important matter with them; the word expresses an interdiction, the object struck being supposed to at once be placed under the control of a divinity.

The inhabitants of all of the different groups of islands, while all closely related, vary more or less in habits and customs. One of the most important of these people were the *Maoris*, of New Zealand. The Friendly Islands were inhabited by the *Tongas*. Other islands were populated by the *Tahitians*, the *Pomotonans*, the *Marquesans* and others.

The Philippine Islands comprise an archipelago of over two thousand islands of various sizes, from mere rocks to large islands the size of Luzon and Mindanao. This archipelago extends nearly north

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and south, and is situated in 4°–21° north latitude and 117°–127° east longitude. The islands are mountainous and volcanic.

The inhabitants of the Philippine Islands are of mixed blood of diverse ethnic elements, so that the problem of tracing these people to their original primitive stocks becomes a very difficult matter. A. H. Keane, quoting Dr. Montano and Professor Blumentritt, considers that the original primitive population of this archipelago consisted of Negritos; afterwards, still, however, in prehistoric times, a Malay invasion occured, and this intermingling continued until the arrival of the Spaniards in the sixteenth century; following them, and possibly preceding them, were the Chinese, and it is also probable that at various times there has been an introduction of Polynesian blood.

The tribes inhabiting this region are numerous and of various names, some of the important ones being the *Tagalas*, the *Bisayas*, the *Ilocanes*, the *Pampangos*, the *Igorrotes*, the *Tingianes*, the *Apayos*, the *Bogobos* and the *Samals*.

As to the number of inhabitants in the Philippines, Prof. Dean C. Worcester says: "The total population of the archipelago is not definitely known, as census returns are necessarily inaccurate, but it is usually estimated at from eight to ten millions. It is divided between more than eighty distinct tribes, which, for purposes of discussion, may be conveniently grouped as Negritos, Mohammedan Malays, pagan Malays, and civilized Malays."

The Andaman Islands, which are situated in the

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eastern portion of the Bay of Bengal, are a thickly-wooded group, and are inhabited by a people known as the *Andamanese*. They belong to the lower type of human development. In height they are usually below five feet; their complexion varies from a dark brown to a black; their hair is crisp and woolly; they are beardless, and have very little hair distributed over the body. They have no settled abodes, but go from island to island, living upon fruits, fish, and the products of the chase. They present the essential characteristics of the Negrito, and have been described by Flower as presenting an infantile negro type.

They are essentially of the same temperament as are the other insular peoples which are related to the true African blacks. Our knowledge as to their religious beliefs is very vague, but it seems that they believe in a supreme being, which is considered by them to reside in a large stone house in the sky, and who possesses a universal knowledge of all things during the daylight. At night all objects are possessed, and their destinies are controlled by other supreme beings. There are a number of tribal groups among the Andamanese, and each speaks a different modification of their language; their languages in general are not considered to show any positive affinities with any other tongue.

The *Papuans* inhabit New Guinea, the Pelew and Solomon Islands, the New Hebrides, New Caledonia and the Fiji group. A characteristic feature presented by the Papuans is their great quantity of black, long, wooly hair, which grows more or less

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over the arms, breasts and legs, but which is particularly abundant on the head and face. Their lips are thick, their nostrils are broad, and their legs are thin. The color of their skin varies from dark brown to black. In different portions of their habitat they present considerable variation and are generally considered to be of mixed blood.

The Papuans of New Guinea occupy a low stage of development, and are noisy, talkative, inquisitive, and of a restless disposition. In color they vary from a coal-black to a dark brown; they have wooly hair, and there is a considerable quantity of it on the body and face. They are on an average of medium stature and their legs are thin. The physiognomy of the Papuans varies considerably. In occupation some are hunters and fishers and others are tillers of the soil. Their small boats are well constructed, and in the navigation of them they are quite expert. They are all exceedingly superstitious, and the various noises of the forest are considered to be associated with various spirits.

In New Guinea, the Fiji Islands and New Caledonia they cook in earthen vessels. The *Fijians* are familiar with the art of dyeing and stamping their clothing. When the Dutch sailors furnished the natives of Humboldt's Bay, in New Guinea, with pencil and paper, they were able to draw fishes and birds very satisfactorily. They were familiar with the bow and arrow. The agriculture of these Papuans consisted mainly in the cultivation of the bread-fruit tree, which they grow in their fields and gardens, enclosed by fences. These people have

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been well spoken of for their chastity and morality, also for their parental and filial affection, but in parts of New Guinea, New Caledonia and the Fiji Islands cannibalism is indulged in. They are strong believers in a future life, and man is supposed by them to continue the work in the next life which he abandoned in this. Their languages are said to be agglutinating.

The Fijians are considered to be the best developed people among the Papuans, this being due primarily, perhaps, to Polynesian influence. They are polite and polished conversationalists, and have a strong feeling of national pride. Their mythology is rich. They worship the dead, and the serpent is symbolic of the creator of the earth. Their pottery in red and blue clay is exquisite. Their boats sometimes exceed one hundred feet in length, and are fitted with masts and sails. Their villages are fortified, and food said to be sufficient to last for a period of four years is stored up.

The inhabitants of the New Hebrides, New Caledonia and the Fiji Islands are sometimes referred to as *Melanesians*, and all of these people present more or less evidence of a mixed type, especially eastward, where Polynesian relationship becomes easily recognizable. In stature they are generally taller than the Papuans, and their skull is more dolichocephalic, although there is considerable variation. In color they vary from the black of the Negro to the yellow of the Malay. Their hair is usually wooly, although sometimes straight hair is observed among them. All of these characteristics indicate quite a mixed

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relationship. The Melanesians are in occupation devoted mainly to agriculture, cultivating particularly the yam and the taro. They build their small, artistically-decorated houses on piles; but communal residences are also used; and in New Caledonia they dwell in circular tents. Their weapons consist of the bow and arrow, the club, and the spear. They also make weapons and tools of stone, wood, shells, and human bones. Occasionally they make pottery. Their canoes, which may be either single or double, are well and shapely built, but they do not take long voyages. Melanesian women are said to be chaste and modest. Their religion is principally a form of ancestral worship, and they have a custom of preserving the skulls of their dead. The languages of the Melanesians, like their physical characteristics, present much variation, and this also indicates that they are a mixed people. Not merely do the inhabitants of the various islands speak different languages, but also in the same island different dialects and also different languages are sometimes spoken.

The largest island in existence, and which is frequently referred to as a continent, is Australia. In area it is nearly twenty-five times as large as Great Britain and Ireland. This land is described as being exceedingly compact, and on the eastern and western shores presents an almost unbroken outline. The absence of rivers of importance communicating between the ocean and the interior of the island is characteristic, and has, without doubt, affected greatly the distribution of life in this

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region. Australia lies almost wholly within the temperate zone, and, as a rule, enjoys a most equable climate, although at times there are great irregularities, due largely to the variability in the rainfall in all parts of this island-continent. At times there are periods of drought, and at other times there are seasons of flood. The flora of this region is extensive and characteristic, there having been described up to the present time about 8,000 species of plants, considerably more than has been found in the whole of Europe. The animals here found constitute the most unique group at present living. Those forms of mammals common in other regions are here totally wanting, while those pouch-bearing mammals, the marsupials, are well represented. Another group characteristic of Australia is the order Monotremata, which includes that curious animal, the Duck-bill.

As the plants and animals of this land are to an extent isolated and peculiar, so are the human inhabitants to a lesser extent characteristic. Physical conditions which are favorable for the development of such peculiar types in the lower forms of animals certainly were not conducive to the improvement of man.

In height the *Australian* is slightly below the average European, but is of a slighter and feebler build; the lower extremities are poorly developed, and the muscles of the calf of the leg are small. The skull, as a rule, is dolichocephalic. The nose comes from a narrow base, but broadens out. The cheek-bones are high. The mouth is large, and the

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teeth are well developed, the third molars frequently possessing three separate fangs. The complexion is described to be of a dark coffee-brown color. The whole person, and especially the head and face, is covered with a profuse growth of hair.

While the Australians probably owe their origin to several ethnic influences, the dominant and fundamental characteristics in them seem to be negroid, although they differ in the character of their hair, which is not woolly nor frizzly, but rather curly, wavy and sometimes bushy. Relative to them Prof. F. Ratzel says: "In their cast of features may be recognized an intermediate stage between negroes and Malays, what is called a hybrid physiognomy. We are reminded of the Malay by the straight rather than woolly hair, the prominent cheek-bones, the light brown or reddish tint of the skin; of the negro by the prominent eyebrows, the flat nose, the thick lips, the prognathous jaws."

Although there may be some certain minor differences the Australians present great uniformity in their physical characteristics. This is also indicated by their languages which all belong to the same linguistic group, and which seem to have no affinity with any other linguistic group. These languages are agglutinative, and by the addition of suffixes the words are variously modified. Among the Australians, particularly between the different tribes, gesture language is sometimes used. Their intellectual development is generally considered to be quite low.

The energies of the native Australians were

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mainly directed to gaining food for their sustenance. They exhibit great skill in tracking and running down their prey, and while their weapons are primitive, consisting mainly of the spear and the boomerang, they are quite well adapted for their purposes. The Australian has no architecture, very little weaving, no pottery, and hardly any religion. His art is limited to a few crude drawings of animals on the rocks and in the caves. When Australia first became known to Europeans the natives seem to have been in the paleolithic stone age. The man is absolute owner of the woman in their society, buying and selling her as he would his spear or boomerang. The old and infirm are abandoned to their fate, and cannibalism is common. They live mainly in roving tribes, and, except for a few loose family ties, there is no government. Their language is primitive, and their vocabulary, while small, is fairly well expressive. They are said to acquire words from foreign languages with facility. Sickness and death are supposed to be caused by evil spirits, and the sorcery of the priest or magician is frequently resorted to. It is considered that a man that dies in battle, or is unburied in a field, becomes an evil spirit. Food is sometimes placed on the graves of the dead, and ceremonies of mourning are sometimes carried out. Sometimes the dead are burned. While their culture is primitive, it is important to note that they have a conception of writing in their "message sticks," on which they incise a series of notches, lines and figures, and thus send information. Their hospitality, as exhibited by the

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half-starved tribes of Cooper's Creek to the last survivor of Burke's expedition, should always be kindly remembered.

The aborigines of Tasmania are now an extinct people; the last male died in the year 1869, and the last female in 1876.

They were so far as anthropologists are able to determine never a very numerous people; it having been estimated that probably they never exceeded 5000 individuals, although, necessarily, this is problematical. They first became known to the White race through the early French explorers, and, later, the early English settlers. The Tasmanians were not at all reconciled to the advances made into their territory by the Europeans, and hence the cruel and bloody war of extermination of the natives began. In the year 1830 an effort was made to save them from extinction, and many of them were induced to come into a settlement where they were provided for; but the effort was made too late, and hence these people have slowly but surely faded from the face of the earth. The *Tasmanians* were of a most inferior type of humanity, being savage, treacherous and untamable. Evidence seems to indicate, almost without doubt, that they were the same people as the Australians, only, if possible, occupying a lower stage of development and a different geographical position.

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CHAPTER VII.

THE DEVELOPMENT OF CULTURE.

CONTENTS.—The early condition of man, physically and mentally. His necessities. Origin of culture. Implements and weapons, paleolithic and neolithic. Food. Fire. Language. Writing. Environment.

IT is exceedingly difficult, if not impossible, for us to conceive of the many difficulties and adversities which must have beset primitive man at the time of his origin or of his differentiation as man. Entirely without any of the later methods which served for the accomplishment of his necessities, comforts, and advantages, early man surpassed those animals with which he was contemporaneous in mainly one important particular, and that was in the development of his brain.

He was superior mentally in all respects to the lower animals, and this single point of superiority, along with the structural development of the human hand, gave him the great advantage which he has since maintained and increased, and which has resulted in the great progress made by the human species in all of its various aspects of development.

In the origin and development of any special line of culture among any people, there are, it seems to me, two important factors or causes in suggesting and developing that culture, to which, so far as I know, attention has not been previously directed. These are, *internally*, the mind itself,

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which must be sufficiently developed to recognize that it is possible to invent new methods for the accomplishment of particular purposes; and, *externally*, the environment which suggests and renders this accomplishment possible or necessary. Without either capable mind or suitable environment culture cannot develop, and, conversely, with capable mind and suitable environment culture will inevitably result, and it is not at all remarkable that it does so.

The earliest members of the human family perhaps lived in the forests near or in the tropical regions of the old world. Their homes were probably in caves, or under trees, or protruding rocks, or any other location which might afford them shelter from the elements and animals with which they were contemporaneous; many of the latter, without doubt, made the life of man most hazardous.

Food and, possibly, clothing were among his earliest necessities; the former being of course imperative, and the latter adopted as climatic conditions and purposes of personal adornment might suggest. The quest for food must at times have been severe. As to the character of food preferred by primitive man we cannot tell, except, we do know that man at the present time prefers and seems usually to prosper best on a mixed diet of both animal and vegetable food, and as nearly as can be determined this has been the character of diet used from the earliest times of human existence.

Agriculture, of course, at this time had probably not even begun, and such vegetable products as

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were utilized as dietetic articles must have been selected rather promiscuously, guided probably very largely by the sense of taste. It is likely that animal food was depended largely upon, and the obtaining of it must necessarily have been one of the most important industries of primitive man. Various snares, such as traps and pitfalls, were probably used to capture animals. Weapons of offense and defense were likewise resorted to, many of them being the inception of those which, variously modified and improved upon, are still in use at the present time. The first weapon used by man was probably a stone or a stick or a club wielded or thrown by the hand and arm. The latter method, that is, of throwing, constituted an advancement confined to man, for man is the only animal that can intelligently attack an enemy without coming into direct contact with it, as is the case when weapons are used. The only possible exception that can be taken to this is, that it has been alleged that some of the anthropoid apes have been observed to defend themselves by the throwing of missiles.

Man has been designated by some to be a "tool-using animal," and in this particular he differs from all of the lower animals.

The most primitive form of implement is one that has been formed by natural agencies other than man, but which at the same time may be used by man as either a weapon of defense or offense. This is well illustrated, as we have just seen, by the stick, club or stone hurled from the hand at the object of attack.

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In the evolution of defense and attack probably the first of all weapons were sticks and stones. If the stick were a heavy one it became a cudgel; if it were knobbed on one end it constituted a club or so-called war-club, which is such an important weapon among all primitive peoples, and from which evolved the spear used by various savages, and which compares very favorably with the bayonets used by modern civilized warriors in piercing down those who differ from them on some political question.

Man at the earliest period of his existence probably used many stone weapons and implements. The earliest of this character would be a stone of convenient size and shape which could be hurled at an enemy, or others which could be conveniently used in grinding his food, or for making and sharpening other implements of wood and stone in such ways that different utilitarian purposes might be accomplished by them. Stone was used to chip stone, and suitable portions were bound tightly to the end of sticks, thus improving on the primitive war-club, and resulting in the devising of the hatchet, the hammer, the axe and the tomahawk of the American Indians.

The implement of this character, possessing a sharp edge adapted for cutting, shows a higher development than the one merely adapted for hitting or hammering, and illustrates those implements which by archæologists are termed chipped, and which are of such great interest to those studying the remains of the workmanship of early man.

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This method of chipping and flaking stones is the foundation of stone implement-making which has been so universally employed by the various peoples of the world at different periods of their early development. These implements have been found in the gravel deposits of the quaternary period, and were used by the oldest known of all peoples inhabiting Europe.

At a later period of human development these implements were not merely chipped, but were also polished, and thus evolved the so-called *neolithic* stone implements, the older non-polished implements being denominated *paleolithic*.

At a later period various peoples became acquainted with some of the metals, and then originated the implements of copper, bronze and iron, which in the main were patterned after their earlier implements which had been made of stone and of wood.

The bow and arrow have been used by primitive peoples from very early times, but as to the origin of the bow there is very little known. The arrow is modified from the spear, and the art of feathering the arrow goes back beyond our earliest written history. Various kinds of bows have been made, the most complex of which, but not necessarily the most effective, was the so-called cross-bow, which was used in Europe during the sixth century.

Another weapon used by early man was the blow-pipe, which had quite a simple origin, but which in reality was the inception of the fire-arm, which has since wielded such influence in the affairs of men.

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With pellets made of suitable material and small darts as ammunition, some of the Indian tribes of the South American forests, the so-called hunting tribes, found the blow-pipe to be of great service in the shooting of small game, and even in war this weapon was to an extent used by them, the points of the darts being frequently covered with *Curari* poison. Some of these blow-pipes are from eight to twelve feet in length, with the calibre almost large enough to admit the end of the little finger. The stem of a small palm tree or reed is used in the manufacture of them.

The arrows used are sometimes from fifteen to eighteen inches in length, and are sharply pointed and so notched as to break off in the wound. In Peru, arrows as small as one and one-half or two inches in length have been used; they were likewise poisoned, and it is said that accidental wounds have proven fatal.

In many portions of the Malay archipelago the natives have long used the blow-pipe. In Borneo the Dyaks have an iron spear-head which they are able to attach to the end of their blow-pipe and thus convert it into a spear. When it is used as a blow-pipe their arrows are small, and are tipped with a piece of pith which corresponds in size with the calibre of their blow-pipe. In the pith are placed sharp fish-teeth, and these are poisoned with upas juice, which when thus used has proven fatal to man when shot from a distance of forty yards away.

After the invention of gun-powder the principle

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of the blow-pipe became so modified as to be used in connection therewith. Instead of a reed an iron barrel was used, and the expulsive power, instead of being air-expelled from the chest, was gun-powder. The near end of the iron barrel was closed; a touch-hole was made, through which by bringing fire in contact with the powder the explosion was accomplished.

The quest for food is perhaps the most necessary occupation of all animal forms, and it is probable that mankind originated in a region where the food supply was such that it could be obtained without any very great difficulty. The tropical regions in all parts of the world are especially rich in their fauna and flora, and in these regions many varieties of vegetable and animal foods are available with very little effort.

The dentition and habits of man from the earliest time indicate that a mixed diet of both vegetable and animal food is the nourishment best adapted to his needs.

Among the tropical dietetic plants, perhaps the most important to mankind have been those included in the order *Palmaceæ*, or the palm family. A few of them are found outside of the tropics. Many of them possess stems which when young and tender make palatable and nutritious food, and when matured yield farinaceous substances. From many a sweet sap, taken by incision, sugar, spirits and vinegar may be made.

In the tropics of South America the *Guilelma speciosa*, which bears the pupunhas, which resem-

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bles somewhat the apricot or egg-plant, is much esteemed by the natives. The forests of the Amazon region furnish the Brazilian chestnut (*Bertholletia excelsa*), the Sapodilla plum (*Achras sapota*), the Avocado pear (*Persea gratissima*), the cocoa and the pineapple.

In central Africa the natives eat largely of the nuts of the doom palm (*Hyphaena thebaica*). Throughout Polynesia many of the various bread-fruit trees are found, from which the natives so largely partake. Nearly all portions of the surface of the earth furnish some edible plants, which grow upon hillside, valley or plain.

The various cereals found in different parts of the world have been used as food from the earliest times, as have likewise many roots, berries and nuts.

Many varieties of animals have been and are still used for eating among different peoples. Those first so used were probably those which were most easily procured, such as insects, birds, reptiles and the smaller mammals. Fishing probably developed later, and the spearing of fish is extensively practiced in nearly all regions where mankind exists. The natives of the inhospitable shores of Terra del Fuego feed almost exclusively on fish and on shell-fish, and the heaps of shells and fish-bones which have accumulated in this region as a result is said to be quite extensive. Such shell-heaps, or kitchen-middens, have been found in many regions, those of Denmark being especially famous on account of their association with early European man.

One of the greatest discoveries made by primitive

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man was a method for the production of fire, for by the aid of fire matter may be modified in a variety of ways so as to be more perfectly adapted to the requirements of the human species. By means of fire the surrounding temperature is modified to suit our comfort, and our food is likewise cooked. Fire has been used as a protection from various savage animals with which man has had to contend in many parts of the world. Canoes have been constructed by hollowing out the trunks of trees by means of fire. The artificial ash-heaps of very early date that have been found in various portions of the world, associated with other evidences, seem to indicate that all of the various branches of the primitive human family had a knowledge of fire and its uses and artificial production.

The manner by which early man first became acquainted with fire is, and necessarily always will be, a matter of conjecture. It seems probable, however, that the fires produced by the elements of nature, such as that from lightning and volcanic eruptions, may have been utilized; and gradually these sources failing or becoming insufficient to meet the necessary demands, the primitive people finally discovered methods by which fire might be produced at will. That friction produces heat is illustrated in all cold climates by the way in which most persons are accustomed to rub their hands together in order to keep them warm. In many portions of the world the natives have produced fire on exactly this principle, only instead of rubbing the hands together they have used dry sticks of

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various kinds of wood. The difficulties attending the production of fire by means of friction are very great, and that early man acquired this knowledge and was able to accomplish it is truly very wonderful, and yet we positively know that many tribes in various portions of the earth have from very early times, and still do, utilize this method.

The inhabitants of Polynesia have a most primitive method, which is still in use, for producing fire. A piece of wood is grooved, and in this groove a stick is rubbed backwards and forwards with sufficient force and rapidity until it commences to glow, and when enough heat or fire is thus generated, some soft, inflammable, dry substance, as some vegetable fabric, is brought in contact with the glow, and thus a flame is produced. In certain parts of South America the natives bound together two pieces of wood, and between these a stick was rapidly revolved with sufficient force until a glow or a flame was produced. Other people, however, discovered that two sticks bound together were unnecessary, and that one piece of wood with a suitable depression would answer the same purpose, and that in this depression the second stick could be rapidly revolved and produce fire. This constitutes the fire-drill which has been familiar to many peoples in various portions of the world for ages past. It was known to the Indians of North, Central and South America; it was used by the Bushmen, Hottentots and other tribes in south Africa; by the natives of Ceylon, and also by the natives of Australia. Geographically these peoples were so far

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separated that it is not possible that the knowledge of the fire-drill could have spread from one to the other of them, and therefore we are compelled to conclude that this indicates an independent development of culture along similar lines, necessitated by the demands made by a similarity of environment on peoples sufficiently qualified mentally to respond thereto. This same principle we see illustrated in many different phases by the early peoples of various parts of the earth, sometimes separated by broad seas, vast mountain chains and mighty forests, making in some instances communication between them very improbable.

There are not at the present time, and so far as is known there never were, any people without language. The faculty of speech is the result of both physical and psychical causes, and the sounds which human beings are able to give expression to by means of the voice for the conveyance of ideas to other individuals constitutes language.

Language is, so far as can be positively determined, limited to the human species, although by some it has been suspected to exist in some of the lower animals. That many of the lower animals are able to communicate with one another is true, but this communication, for many reasons, cannot be considered language in the sense in which human beings communicate with each other.

In the development of the languages of the various peoples of the world two factors are of especial importance, the one being the human mind, with vocal structures able to produce sounds, and the

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other being the environment. The operations of the mind result in thought pertaining to matter suggested by the individual or by the environment or by both, and the expansion of the same by means of the organs of the voice results in language.

By the study of words and sentences, linguists have been able to reduce the languages spoken by mankind to the three following groups or types: The *monosyllabic*, the *polysyllabic* or *agglutinative*, and the *inflective*. In the monosyllabic group the words are all roots, and there are no modifications by the use of prefixes or suffixes. This form of speech is illustrated by the Chinese language and its dialects.

The polysyllabic or agglutinative group is where words are formed of several elements which are so brought together as to modify the root sound in the expression of the idea, as by the use of prefixes and suffixes. The idioms of the American aborigines, the Basques, the Berbers and the Finnish languages illustrate this.

The inflective group of languages includes those in which the root form may be modified to express its relations to another root form. The Semitic and the Aryan languages belong to this class; only two European languages are here not included.

It has been estimated that there are about one thousand distinct languages. These did not originate separately, although in many instances there are groups of languages which indicate that they probably originated from one common ancestral tongue. A group of this character is designated to be a family, and is admirably illustrated by the Romance

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family of languages, which includes, among others, the French, the Spanish and the Italian, all of which originated from, or are descended from, the Latin, the language of ancient Rome.

Language has been, and still is, of much service to the ethnologist in the classification of some of the various divisions of mankind. This is especially true in those instances where physical criteria cannot be found in the peoples compared, owing to the fact that the resemblances existing between them are so strong that sufficient physical data for purposes of differentiation does not exist. This is especially true of the American Indian tribes, which as a rule present such strong uniformity of physical type throughout the whole of North, Central and South America, with perhaps a few slight exceptions. Here language is resorted to as a means of classification; it is about the best method available in arranging these peoples, although it is not an altogether satisfactory guide.

It must not, however, be inferred that similarity of language necessarily indicates relationship, for such is not always so. Frequently, for example, Chinese or Africans are found that are able to speak good English, although of course there is no blood relationship. Instances have occurred where in war one group of people have made a conquest of anan other group which spoke a different language. In an instance of this character the languages of the conquerors and the vanquished are likely to undergo modification, although there may be no blood relationship.

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Writing is the recording of characters on any substance which characters may convey ideas to the mind of another.

When, where and among what people writing first had its origin we do not know, and it is impossible that we ever will know, for the reason that the genesis of this art probably began unconsciously in the development of the human species, and afterwards, by the recognition of the significance of these unconscious signs, and by the imitation of them, the, in one sense, artificial and more complex methods were adopted, and the subsequent development of the art became possible. In the consideration of the doings of primitive man from any standpoint there is one factor that it is especially difficult, if not impossible, for us to comprehend, and that is his mental capacity.

As to the unconscious beginning of writing, it might be illustrated thus: Let us suppose, for example, that some primitive man or men might have had an encampment. This may have necessitated the chopping down of trees with their primitive stone implements for the building of huts and the making of their camp-fires. The forming of their camp thus became, to an extent, the recording of certain facts, although of course it was *not* done with the intention of conveying ideas to the minds of others; nevertheless, the camp afterwards deserted, it was possible for it to convey certain facts and ideas to the minds of individuals who might arrive later. Coming to the sight of this former abode of early man, the ashes from their camp-fires,

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the stumps remaining of the trees cut down, the underbrush broken and destroyed, all told a tale as clearly and as truly in many respects as could be done by pen.

This being true it is certainly a legitimate deduction that here, in illustrations such as this and many others that could be given, we find the suggestion in a perfectly natural manner that prompted the early members of the human species to make characters for the conveyance of ideas.

The remaining stump of a tree, cut down for some utilitarian purpose, tells most plainly to later comers that predecessors were present. Unintentionally it furnishes positive information as to the presence of others in that particular region. This being true, it is but a step for early man to have recognized the possibility of intentionally communicating to his fellows by merely incising a tree, as so many savages still do at the present time in various regions of the world.

The theory here presented as to the inception of writing, it seems to me, furnishes a natural explanation as to the origin of that great art, more natural than is the view held by, I think, all previous writers, that picture-writing constituted the earliest method. We also know that in the development of the child the pencil-in-hand lines are executed before pictures are drawn.

Picture-writing is, however, a very old method of thought-recording, and many interesting and valueable specimens of it have been preserved. At the time of the discovery of America this system was in

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very extensive use by the hunting tribes of the North American Indians.

The picture of any animal, as a bear for example, drawn with the intention of representing that animal only, would be a pictograph. This method of graphic representation of thought has been utilized by nearly all savage peoples in various portions of the world.

A next higher stage in the development of writing is where the picture of an animal or any other object is used, not to represent the animal or object drawn, but to represent something else other than the actual object drawn, as, for example, a turtle might be drawn to represent the earth. The picture thus becomes *symbolic*. From these symbolic drawings of animals and other things, abbreviations or signs were later used, and thus instead of the picture or the symbol being entirely depended upon for the conveyance of the thought the characters became *idiographic* in character, and later, through the association with these, signs of certain sounds, the *phonetic* characters developed, and the gap from thought-writing to sound-writing may have been so gradually accomplished that were we able to compare complete data from one to the other it might seem less remarkable, and the creation of alphabets would probably be much more satisfactorily understood.

It is not at all probable that any of these methods for the graphic representation of thought developed suddenly in any one place at any one time, or that the adoption of one method resulted in the aban-

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donment necessarily of the others. On the other hand we know that in some instances at least several of these methods were used simultaneously in the same manuscripts.

In America we find that the Aztecs of Mexico and the Mayas of Yucatan were the most accomplished of all of the American aborigines in the art of writing; both of these peoples had at the time of the discovery a literature of no mean character, and the attempts at the translation of which has since been a matter of much puzzling interest to students of American linguistics. It has been considered by some authorities on this subject that both the Aztecs and the Mayas were partly familiar with and used to an extent phonetic characters in their manuscripts. Some have even gone so far as to attempt to connect these American manuscripts, with their curious hieroglyphic characters, with those of the ancient Egyptians.

The hieroglyphic picture-writing of the ancient Egyptians, through the inscriptions, may be traced back for a period of more than six thousand years, to the time of the second Egyptian dynasty, when it had already attained great perfection, indicating that its origin must have been at a much earlier period. It comprised pictorial ideograms, which resulted in certain verbal phonograms, some of which were used as syllabic signs. About forty-five of the four hundred phonograms were of an alphabetic character associated with vocal sounds. The origin of our own alphabet may be traced back to these Egyptian signs.

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The Phœnicians, taking the Egyptian hieroglyphs as a basis, rejecting all unnecessary characters, formed the first true alphabet of which we have any knowledge. The first true origin of the alphabet was pointed out by M. de Rouge in 1859, when he contended that the prototypes of the Phœnician characters existed, not on the monuments of Egypt, but in the hieratic or priestly writings as found especially in the Papyrus Prisse, which was found in a tomb belonging to the eleventh dynasty.

Many and diverse are the conditions under which the human species exists. In the frigid, the temperate and the torrid regions; in the forest and on the plains; in the depths of blackest savagery and in the highest of civilization mankind lives, and, to an extent, shapes the destiny of his successors.

The environment under which living things exist is not a stable one, but is continually changing. This being true, it follows that organic forms are thus constantly subjected to different conditions, and it thus becomes necessary that they, according to circumstances, adapt themselves to this changing environment. If they are not able to so adapt themselves they are placed at a disadvantage in the struggle for life, and extinction in the case of many of the lower animals has occurred in consequence thereof.

In the case of mankind in relation to this changing environment we see it illustrated with the change of seasons.

With the advent of winter in the temperate regions it becomes necessary for man to change those

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habits of living which he followed during the summer season. He wears different clothing, lives more indoors, eats different food, and in a variety of ways he lives in the winter a different life from that which he follows during the summer season. In so modifying his habits of life, according to circumstances, he is merely adapting himself to his new environment.

This principle of adaptation applies not merely to the individual, but also to the larger groups and races of mankind.

An illustration of this may be seen in the peoples inhabiting the region of the Caucasus Mountains. These mountains, stretching for a distance of about 750 miles between the Black Sea and the Caspian, instead of running in a general northern and southern direction, as the majority of great mountain chains do, trend in a general direction east and west. Their height varies greatly, ranging in places from 250 to 10,000 feet, and in numerous ways the topography is extremely variable and unique. The environment here furnished for mankind is, therefore, a very diverse one.

The peoples inhabiting the Caucasus region are considered to have come from about the same stock, but owing to the fact that the region in which they live presents such great physical diversities they, in adapting themselves to these varying and various conditions, have as a result developed among themselves many differences in their methods of life, their customs and their language.

Racial adaptation cannot be better illustrated than

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by considering how well the white race has adapted itself to the environment of America since the time of the discovery.

No better illustrations of physiological and anatomical adaptation can be given than the description of John Hunter's experiment on the buck as narrated by the late Sir Wm. MacCormac in the Hunterian Oration of 1899: "He tells us that in July, 1785, he had a buck thrown and tied its carotid artery. Immediately the pulsation in the velvet ceased and the antler grew cold, but on returning a week or two later he found warmth restored and the antler growing. The buck was now killed and sent to Leicester Square, and upon examination Hunter found the ligated artery obliterated and the circulation carried on by the other, generally small, vessels above and below the place of ligature, which had thus restored the blood current in the growing antler. Nevertheless, he felt uncertain whether the same result would occur in man, and in December, 1785, he carefully explained the alternatives to his first patient, a coachman, who was suffering from popliteal aneurism, in St. George's Hospital. He told him of the usually fatal method of incision and evacuation of the sac, the better chance of life by amputation, but with loss of limb, and guided by his experience of the return of the circulation in the antler of the buck, he said he would try to save both his life and limb. The patient consented, and six weeks afterwards he left the hospital cured of the aneurism, although he died fifteen months afterwards from another malady." In this interesting

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narrative and, at the time, wonderful experiment, the blood supply to the antler was cut off. Nature, however, through the formation of the new small arteries, established collateral circulation; and thus resulted an adaptation to environment which saved the antler; and so, in many instances, the same principle may be illustrated.

The relationship existing between, race, climate and disease is a subject which has not until very recently received that consideration which it deserves; now, however, the importance of the matter is becoming more recognized by physicians in both Europe and America, as is shown by the organization of societies for the study of tropical diseases.

The effect of temperature on health seems to be the most important factor so far as climate is concerned. Most Europeans and white Americans from the temperate zone that go directly into the tropics are likely to suffer from anæmia, gastro-intestinal disorders, malaria, typhoid and yellow fevers. If the change of climate be made gradually the individual is more likely to be able to adapt himself to the new environment and thus less subject to these diseases.

It has been claimed that there is a relationship of mortality to the winds blowing from the north and east, and inverse relationship to those winds which come from the south and from the west.

A change of climate may affect some organs favorably and at the same time other organs detrimentally. For example, a climatic change may benefit a lung disease, but cause liver trouble. A

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dry, tropical climate may be conducive to health in permitting outdoor life and exercise and thus promote certain factors that are conducive to health; but such environment is also favorable to the development of the lower forms of life, including, frequently, those micro-organisms which are productive of disease. It is alleged that in India during the hot, dry season, when small-pox is frequently extensive and severe, that vaccination is hardly safe, because of the great tendency of mixed infection occurring in connection with the vesicles resulting from the vaccination.

Another factor concerning the health of the individual which must be modified by climate is exercise. In general, it is recognized that extremes of temperature tend to produce indolence in the individual, and that the greatest energy is usually shown by the inhabitants of the temperate regions. This, however, is dependent to a great extent upon race.

Many recognize the importance of exercise as being necessary for health, but comparatively few, even among medical men, have considered the full importance of the subject from the biological standpoint, which is, that the use of an organ or structure within reasonable limits tends to its development and perfection, and that, conversely, the disuse of an organ or structure tends to its atrophy and degeneration. Furthermore, if this disuse be continued indefinitely the structures involved may become useless or may even disappear; and, in the case of some of the lower animals, the extinction of the form has resulted.

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It is considered by biologists that the influences of environment affect structure through function, and that structure is modified thereby. In the average man of the white race a number of illustrations of this factor can be seen. Take, for example, the foot. Owing to disuse the toes in civilized man have degenerated to such an extent that in the adult they have become almost functionless through our custom of wearing shoes. Among savage peoples, where shoes are not worn, this loss of function on the part of the toes is not observed; and, in infants of the white race, there is relatively more power in the toes than in those of adults.

In the case of the hand, through use, the fingers have improved, as is seen in many occupations which require that they do the most delicate work.

The gastro-intestinal tract shows certain modifications which have accompanied our higher civilization; and, that this could produce still greater structural changes is possible; and it should be so recognized. Through disuse the teeth of the white race are undergoing a degeneration, which all interested in the human welfare, especially physicians, should recognize. In the different races of mankind the teeth present certain differences. Among the dark-skinned races they being, as a rule, larger and stronger than among the white.

As the methods of food preparation in vogue among the higher grades of the civilized members of the white race have thus resulted in a disuse, which has been productive of an actual change of structure so far as the teeth are concerned, so this change

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can, and to an extent has, affected the gastro-intestinal canal, as shown by some investigations among the French, which indicate that a narrowing of the intestinal tract has resulted.

To the writer it seems that this, if nothing more, should show conclusively that mankind can never thrive as a species on concentrated foods, for the reason that concentrated foods would relieve the system of certain work that it is supposed to do. This relief of function would be a disuse, and this disuse would in time, although it might require many generations, be productive of such a degenerative change of structure as might jeopardize the existence of mankind.

In the transmission to offspring of those characteristics that have been developed and increased by use, it is considered by some that those which are unfavorable to the individual are more readily transmitted than those which are favorable. An unfavorable characteristic thus once established renders a predisposition to various other troubles.

With this predisposition, however, there is not the tendency for the pathological modification to be transmitted to the offspring in the same degree to which it is present in the parent, for the reason that there is ever present that tendency for a more perfect adaptation to environment, and also that with the pathological variation, as a rule, only one of the parents is affected.

In the case of disease, when it is acquired, it may exist temporarily or it may become permanent in the individual. The longer the duration of the dis-

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ease and the more severe it is, and the more vital the parts involved, the greater becomes the probability of its producing permanent and hereditary effects; and, conversely, the shorter the duration of the disease, the less its intensity, and the less vital the structures involved, the probabilities of its transmission become correspondingly diminished.

The susceptibility which is frequently shown in certain individuals to certain diseases is also in some instances shown in races. Thus, in negroes there is a decided predisposition to lethargy. They also show a certain immunity to yellow fever, although not an absolute one.

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INDEX.

Abo, 79.
Abyssinians, 135.
Afars, 133.
Ainos, 101.
Akkas, 68.
Albanians, 141.
Aliculufs, 126.
Aleutians, 101.
Algonkins, 113.
Andamanese, 69, 150.
Angles, 139.
Anthropoidea, 34.
Aonik, 126.
Apayos, 149.
Arabs, 134.
Arawaks, 124.
Archæan, 44.
Armenians, 135.
Arthropoda, 21.
Aryans, 136.
Assiniboins, 115.
Assyrians, 135.
Aurignac, Cave of, 47.
Australians, 154.
Avars, 143.
Aztecs, 118.

Babylonians, 136.
Baktrians, 141.
Ba-Frot, 81.
Ba-Lolo, 81.
Ba-Ngala, 81.
Bambaru, 77.
Baniuns, 76.
Bantuas, 76, 78.
Barabras, 78.
Barombi, 79.
Barotse, 79.
Basa, 79.
Bashirmi, 78.
Baskirs, 98.
Basques, 136.
Batwa, 63.
Bayon, 79.
Bechuana, 79.
Bedjas, 133.
Berbers, 130.
Biology, 17.
Bisayas, 136.
Blackfeet, 114.
Black race, 67.
Bogobos, 149.
Bolo, 78.
Botany, 17.
Botocudos, 124.
Bu-Banghi, 81.
Bulgarians, 140.
Bushmen, 68.

Caddoes, 116.
Cahitas, 118.
Calaveras skull, 109.
Cambrian, 44.
Caribs, 124.
Carnivora, 32.
Carboniferous, 44.
Catarrhine, 35.
Caucasic peoples, 142.
Cayugas, 114.
Cell, 15.
Cetacea, 31.
Cheiroptera, 33.
Cherokees, 115.
Chinese, 86.
Chipeways, 114.
Choctaws, 115.
Chonek, 126.
Chukchis, 100.
Cœlenterata, 19.
Comanches, 118.
Congolese, 81.
Coras, 118.
Coroades, 124.
Crans, 124.

Digitized by Google

Creeks, 115.
Crees, 113.
Cretaceous, 46.
Crows, 115.
Czechs, 140.

Daakals, 133.
Dakotas, 114.
Danes, 139.
Darwinian theory, 38.
Devonian, 44.
Dryopithecus fontani, 49.

Echinodermata, 20.
Edentata, 31.
Egyptians, 131.
Environment, 175.
Eocene, 46.
Eskimos, 111.
Esthonians, 98.
Evolution, 37.

Facial angle, 62.
Fijians, 152.
Finns, 97.
Fire, 166.
Flemings, 140.
Food, 164.
Franks, 139.
Fuegians, 126.

Galgai, 143.
Gallas, 133.
Germans, 140.
Gês, 124.
Giliaks, 101.
Goths, 139.
Great Ice Age, 46, 105.
Greeks, 139.
Guanches, 130.

Hamites, 130.
Hominidæ, 36.
Hottentots, 68.
Hovas, 145.
Huns, 140.
Hyracoidea, 32.

Icelanders, 140.
Igorrotes, 136.
Illyrians, 141.
Ilocanes, 136.
Inaken, 126.
Incas, 124.
Innuits, 112.
Inorganic matter, 15.
Insectivora, 33.
Insular peoples, 133.
Irish, 139.
Iroquois, 114.
Ischorians, 98.

Jallouke, 77.
Japanese, 102.
Jews, 136.
Jurassic, 45.

Kachintz, 98.
Kaffirs, 80.
Kamschatkans, 100.
Kamucks, 94.
Kansas, 114.
Karabulaks, 143.
Karakalpaks, 97.
Kassouke, 77.
Kera, 116.
Kirghiz, 97.
Kishi, 143.
Kitchenmiddens, 53.
Kumuks, 97.
Kuri, 78.
Kyrids, 98.

Language, 168.
Lapps, 98.
Latins, 139.
Lemuria, 50.
Lenapes, 114.
Lesghians, 143.
Letts, 141.
Liberia, 77.
Libyians, 130.
Livonians, 98.
Lombards, 139.

Malalis, 124.
Malays, 144.
Mammalia, 26.
Mandingoes, 76.
Manx, 139.
Maoris, 148.
Marquesans, 148.
Marsupialia, 31.

Digitized by Google

Massi, 133.
Matter, 13.
Maxillary angle, 62.
Mayas, 120.
Melanesians, 152.
Metscheriaks, 98.
Mic Macs, 113.
Miocene, 46.
Mistri, 78.
Mixtecs, 120.
Mohawks, 114.
Mollusca, 20.
Mombuttu, 78.
Mongu, 78.
Monogenists, 65.
Monotremata, 30.
Moors, 130.
Moquoi, 118.
Morphology, 17.
Mound Builders, 117.
Muskhogeans, 115.

Nahuas, 118.
Namollos, 100.
Naulette jaw, 56.
Neanderthal skull, 55.
Nebular hypothesis, 42.
Negrillos, 68.
Negroes, 68.
Negroids, 68.
Negro slavery, 83.
Nogaians, 96.
Norsemen, 139.
Norwegians, 140.
Nubas, 78.
Numidians, 130.
Nutrition, 17.
Nyamezi, 81.

Omahas, 115.
Onas, 126.
Oneidas, 114.
Onondagons, 114.
Organic matter, 15.
Orthognathism, 62.
Osages, 114.
Osmanles, 95.
Ossetes, 143.
Ostiaks, 97.
Otomis, 120.

Pampangos, 149.
Papuans, 151.
Patagonians, 126.
Pawnees, 116.
Permian, 44.
Persians, 141.
Physiology, 17.
Pigmies, 68.
Pithecanthropus erectus, 57.
Platyrhinæ, 34.
Pliocene, 46.
Poles, 140.
Polynesians, 147.
Polygenists, 65.
Polystomata, 19.
Pomotonans, 148.
Poncas, 115.
Post-pliocene, 46.
Primates, 33.
Primeval, 43.
Proboscidea, 32.
Prognathism, 61.
Prosimiæ, 34.
Protozoa, 19.
Pueblos, 116.
Puris, 124.

Qquichuas, 124.
Quaines, 98.
Quapaws, 114.

Red race, 103.
Reggas, 81.
Regnum protisticum, 17.
Relation, 17.
Repair, 18.
Reproduction, 17.
Rifians, 130.
Rodentia, 33.
Romans, 139.
Rua, 81.
Russians, 140.
Ruthenians, 140.

Sagais, 98.
St. Prest, 54.
Samals, 149.
Samnites, 139.
Sansandig, 77.
Saxons, 139.
Scotch, 139.
Seminoles, 115.
Senecas, 114.

Digitized by Google

125

Serers, 76.
Shoshonees, 118.
Silurian, 44.
Sioux, 114.
Sirenia, 31.
Skull, 60.
Slavs, 140.
Somalis, 133.
Soninke, 77.
Sorbs, 140.
Soudanese, 76.
Special creation, 37.
Spy remains, 56.
Swedes, 140.
Syrians, 135.

Tagalas, 149.
Tahitians, 148.
Tasmanians, 157.
Tarahumaras, 118.
Tartars, 95.
Tehua, 116.
Teleouts, 98.
Telpehuanas, 118.
Teptiars, 98.
Thibetans, 92.
Timbuctoo, 77.
Tingianes, 149.
Toltecs, 119.
Tongas, 148.
Totonacos, 122.
Trenton gravels, 107.
Triassic, 44.
Tulpis, 124.
Tunguses, 93.
Turcomans, 96.
Turks, 95.
Tuscaroras, 115.
Tushi, 143.
Tzoneca, 126.

Uighurs, 97.
Umbrians, 139.
Ungulata, 32.
Utes, 118.
Uzbeks, 97.

Vandals, 139.
Vei, 77.
Vermes, 20.
Vertebrata, 21.
Vmes, 98.
Vogouals, 97.

Wa-Wuma, 81.
Waste, 18.
Welsh, 139,
Wends, 140.
White race, 128.
Winnebagoes, 115.
Wochua, 69.
Wolofs, 76.
Writing, 171.

Yaco, 78.
Yahgans, 126.
Yakuts, 95.
Yapova, 146.
Yedina, 78.
Yellow race, 85.
Yumas, 116.

Zandah, 78.
Zapotecs, 120.
Zoölogy, 17.
Zulus, 79.
Zuni, 116.

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